THE MAPPING OF THE NATIONAL FORESTS
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Part I. The Mapping of the National Forests

“Accurate maps of the national forests are essential to every activity conducted by the service.”
---Forester William B. Greeley, 1922

A very strong connection exists between a forest’s administrative history and its map record, which compellingly argues in favor of linking a forest’s history to its cartography. In one example in Arizona, on January 23, 1925, President Calvin Coolidge signed presidential proclamation No. 1728 that transferred the southern half, or the Clifton Division, of the Apache National Forest to the Crook National Forest. The proclamation also reassigned the northern portion of the Datil National Forest in New Mexico to the Apache, or the area now referred to as the Quemado Ranger District. This action immediately rendered the existing maps of the Apache National Forest obsolete and led to the compilation of new maps. The first new map issued was the one that accompanied the text of Proclamation 1728, or the “Diagram forming part of Proclamation 1728” at 1:253,440-scale, which was closely followed by new administrative maps dated 1925 and 1926 as well as a 1926 forest visitor map. This 1925 boundary change was the most significant event in the Apache National Forest’s history since its establishment in 1908 and maps produced by the Forest Service, both before and after 1925, document this important land exchange between three national forests. Maps illustrate and explain and therefore should be linked to the administrative history of the National Forest System.

Significantly, it was a Forest Service cartographer, Salvatore Lo Jacono, who, nearing the end of his 40-year career with the Engineering Division, compiled the first reference work covering the administrative history of the national forests. His work recorded official government actions that established, modified, or altered the status and the boundaries of individual forest reserves and national forests. His 1959 work, Establishment and Modification of National Forest Boundaries: A Chronological Record, 1891-1959 has been recognized by the Forest Service as a valuable resource by the fact that the title has been maintained and reissued ever since 1959, first by the Engineering Division and later by the Lands Staff of the Forest Service. Lo Jacono’s cartographic experience over the course of his long career led him to recognize the need for and the importance of a convenient reference work detailing the changes in names and boundaries of the many units in the National Forest System. By combining the administrative history of each national forest with a map listing for each forest reserve and national forest enhances the usefulness of Lo Jacono’s original work. This is what has been done as found in the Regional Chapters in this reference work.

In addition to documenting administrative changes, Forest Service maps are essential to the understanding of environmental and human history of the national forests as both physical and cultural features also change over time. For example, the construction of Libby Dam on the Kootenai River flooded an entire river valley and forced the relocation of people, roads, and railroads. The physical as well as administrative features surrounding Mt. St. Helens are quite different now than before the 1980 eruption. Older maps can show what the land looked like and in some instances, the forest cover at a particular point in time. Vintage Forest Service maps have been used to locate old forest lookouts, abandoned CCC camps, public roads that over time became private and gated, logging railroads and their names, resorts and ranches that have come and gone, mines, and pioneer trails. Old forest names appear

1 When addressing the Regions of the Forest Service, the term used to describe the administrative units will be the one that was used at the time being examined in the essay. When discussing maps issued until 1919, “District” with its numerical designation will be used; from 1919 to 1929, the name of the District, such as the “Alaska District” and/or its numerical designation will be used; after 1929, “Region” will be used along with its name, such as the Eastern Region and/or its numerical designation.

on U.S. Geological Survey topographic and other federal maps as well as commercially produced maps of the same era. Knowing the administrative history of a forest will help determine the publication dates of commercial maps that were often published without them. Forest Service maps can show the beginnings and expansion of special areas, such as national monuments, primitive, wild, and wilderness areas, recreation areas, and experimental forests. Boundaries and names of special areas and ranger districts have changed just as much as the names of the national forests have. Maps record those changes.

The monumental task of mapping the millions of acres in the new forest reserves was begun by the U.S. General Land Office and continued after 1897 by the U.S. Geological Survey under a congressional mandate and appropriations. Even with this beginning, drawing boundaries and evaluating the new forest reserves remained an enormous challenge awaiting Gifford Pinchot’s Forest Service when it was created in 1905 to manage the forest reserves. Initially, the Forest Service was dependent on the mapping produced by the federal government dating as far back to the four great post Civil War Surveys of the West (1867-1879) as well as the General Land Office and the Geological Survey. Thus, the early maps and atlases produced by the Forest Service were largely derivative in nature, or compilations from previous maps with very little new information except what was supplied by Forest Service staff from the field. Map accuracy was also dependent upon these earlier maps. With the introduction of aerial photography for mapping and resource management in the late 1920s early 1930s, the derivative period of Forest Service mapping ended. Aerial photography, together with the technology and equipment necessary to process images, allowed the agency to make its own original and highly accurate maps from its own reliable base data.

The decentralized nature of the Forest Service led to many differences between regions in the appearance of the maps issued for the public. However, for administrative mapping, there were standards, which were uniformly applied throughout the cartographic history of the Forest Service. Diversity at the regional level led to an innovative program of forest visitor map production in the California Region from 1911 to 1918 and also allowed the Northern Region to improve upon the folios of the Forest Atlas of the National Forests of the United States through the addition of topography to the atlas sheets. Centralizing influences guaranteed that these regional initiatives met certain system-wide standards. The interplay of these two dynamic forces within the Forest Service is well illustrated through an examination of the agency’s mapping program.

The course taken by Forest Service cartography closely follows larger 20th century trends in map making and use. Already mentioned is the change brought about by gathering map data from above through overhead imaging from aerial photography and remote sensing. This technological advance was fostered by the exigencies of the first and second World Wars and point to the link between warfare and mapping. During the past century, maps were increasingly used as tools of public administration. From managing the national forests to managing large urban programs of zoning, land valuation, transportation, and public utilities, governments became ever more dependent on maps. Maps were also serving a widening array of day-to-day roles in people’s lives. New purposes include the rise of the road map and aeronautical chart to serve travelers in the land and air, weather maps to predict weather conditions, and maps for outdoor recreation. The new purposes to which maps were put also highlight the democratization of cartography itself. To varying degrees, the mapping program of the Forest Service participated in all of these cartographic themes of the 20th century, including perhaps the largest of all, the transition to computerized cartography.4


4 These themes were enunciated by Professor Mark Monmonier, Syracuse University, at a keynote address, May 15, 2014 at
The major responsibilities of the National Forest System are to protect, manage and develop the natural resources of all System lands, to actively cooperate with other federal, state, local, and private interests in the practice of good forest, grassland, and range conservation, and to conduct research directed toward more efficient management, protection, and use of the renewable resources of timber, grass, wildlife, and water as well as recreation on System lands. Mapping the land base of the National Forest System is largely a supportive activity to these major responsibilities, and, over the years, has not been given the scholarly attention that the other areas of study have had, such as forest management policy, fire protection, and silviculture. There have been many histories of the Forest Service at the national, regional, individual forest, and even at the ranger district level, but none of these have addressed Forest Service cartography or the cartographers that have been engaged in this vital function. The reason may be the stunning lack of original source material documenting Forest Service cartography. Outside of an reasonably adequate collection of letters and documents covering the early efforts to compile the *Forest Atlas of the National Forests of the United States* for each of the national forests between the years 1906-1910, the National Archives and Records Administration holds very little that documents Forest Service map standards, procedures, publishing, printing, and policies governing the making and distribution of Forest Service mapping from the agency’s Engineering Division. What is available to the researcher from the National Archives is a very large and significant gathering of Forest Service maps. This fact points to a fundamental aspect of the following introduction to Forest Service cartography: it is largely based on the actual cartographic production of the Forest Service as well as any and all text and handmade annotations found on the maps themselves and whatever primary and secondary supporting materials that have been uncovered.

There has been a great deal of time, expertise, and funds expended over many years to establish the Public Land Survey System points of reference and land lines in the national forests. Cadastral surveying is an extremely important part of the Forest Service cartography program. Much effort has also been made at the regional level in the making of operational maps for timber sales, fire management, road construction, environmental and recreation planning. However, the guiding principal behind this listing of maps and this essay on Forest Service cartography is that the maps being listed and discussed are ones that are generally available to the public and are found in research libraries, archives, and other repositories. With this in mind, some space has been devoted here to explain how Forest Service mapping has been distributed over the years to the public as well as to libraries.

The cartobibliography that follows each Forest Reserve and/or National Forest in each Regional Chapter is arranged in chronological order, but with the very important exception that the maps most associated with the forest’s administrative history, those that accompanied presidential proclamations and executive orders, will appear first, immediately below that history. Following these are any maps published by the U.S. General Land Office when that agency was administratively responsible for the forest reserves, or the years 1891-1905. Of course, only the earliest forest reserves will have maps issued by the G.L.O. Also, only the earliest of forest reserves will have maps compiled and published by U.S. Geological Survey, the next group of maps to follow G.L.O. mapping. Moving forward in time, the cartobibliography presents citations for the forest atlases produced for that forest followed by general Forest Service administrative and forest visitor mapping produced after 1905. Because of constant reorganization of the forest reserves and national forests in their first 75 years, users are encouraged to follow the histories of newer national forests of today back to their predecessor forests and to follow forests established before1908 forward to discover additional cartographic resources for a particular land area.

the Library of Congress, as part of the program, “*From Terra to Terabytes: The History of 20th Century Cartography and Beyond.*” They can also be found in Volume 6, “Cartography in the Twentieth Century” edited by Mark Monmonier and published in 2015 by the University of Chicago Press, part of the monumental “The History of Cartography” project.
1. Early U.S. General Land Office Mapping

The General Land Office, because of its authority over the public lands, made the first maps of the forest reserves. These were compiled from the bureau’s principal cartographic product, the 1-mile to 1-inch township plat. The G.L.O. maps covering the forest reserves during the decade of the 1890s into the first years of the new century were few in number and drawn at a small-scale. These G.L.O. maps were later used extensively as in-house base maps by the U.S. Geological Survey and the Forest Service in tracking boundary changes and for constructing thematic maps, such as timber type and timber density maps. The National Archives and in some cases, regional Forest Service offices hold examples of these maps today. There is little evidence that General Land Office maps of the Forest Reserves were distributed to libraries or to the public. Research institutions have cataloged very few. Base maps of the forest reserves compiled by the G.L.O. appear in the cartobibliography section immediately following the maps illustrating Presidential Proclamations and Executive Orders. The Division “E” or the Surveying Division of the General Land Office produced the maps for Division “P” the Special Services Division. Later, in 1901, the Special Services Division was renamed the Forestry Division.

The state maps issued irregularly by the General Land Office (known as the Bureau of Land Management since 1946) to show the progress of public land surveying, important federal land withdrawals, administrative organization, and growth of the territorial or state infrastructure, can prove to be important spatial records for the researcher in the history of the national forests. The G.L.O. state maps show military and Indian reservations in red and yellow respectively, national parks, monuments, and game and bird refuges in purple, and water features and federal water projects in blue. Federal forests are shown in green while state and county boundaries, status of public land surveys, towns, and cities, locations of United States land offices, roads and railroad lines are rendered in standard black. These state maps, issued up to 1944, provide a unique and essential state context for the national forests that maps of individual national forests lack. In some instances, they can be the only cartographic representation of a few, early, short-lived forest reserves, such as New Mexico’s Portales National Forest. Many research libraries have cataloged these state maps, which would indicate that these maps were widely distributed. These important state maps are listed in the cartobibliography as Part II.

2. U.S. Geological Survey Mapping 1897 to 1905

One of the many recommendations issued by the National Academy of Sciences Commission in its final report on a forest policy for the United States dated May 1, 1897, was that the U.S. Geological Survey be charged with surveying the forest reserves with an eye towards discovering which lands should be eliminated and which lands should be included in the nation’s forest reserves. The Commission noted: “Only a small portion of the White River Plateau Timber Land Reserve in Colorado…is forest land, the remainder being covered with grasses and scattered clumps of oak bushes. Such land is, of course, most valuable for pasturage and its withdrawal from use cripples the important cattle industry of the region.” Such lands better suited for economic pursuits other than forestry, the Commission members believed, should be eliminated from the forest reserves. The Commission thought that the U.S. Geological Survey was the only federal bureau at the time capable of performing such surveys and that the agency should be appointed with an adequate budget to map and inventory the forest reserves. This recommendation found

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its way into the Sundry Civil Appropriations Act of June 4, 1897 for the year ending June 30, 1898. The Geological Survey was charged with evaluating and mapping the forest reserves and given an annual appropriation of $150,000 to do so.

A year later, on July 18, 1898, the Director of the U.S. Geological Survey, Charles D. Walcott, officially transmitted for publication as Part 5 of the Survey’s Nineteenth Annual Report, 1897 – ’98, a 400-page volume on “Forest Reserves” with 110 maps and a large number of photographs. For the next two years, the U.S. Geological Survey’s substantial Annual Report included a Part 5 devoted to an examination of the Forest Reserves. The maps from these annual reports are listed whenever possible under the Forest Reserve in the cartobibliography under “U.S. Geological Survey Mapping” and include both loose maps included in an accompanying map case to Part 5 as well as those bound into the text volume of the report. Maps with state or regional coverage are listed under a section on maps of the Forest Service region. Each report also comes with a detailed text and black & white photographs that are supplemented by the maps. The text of these reports tends to be organized around the standard 36 square mile township with a description of the timber resources in that township, an organizing principal continued by Gifford Pinchot’s Forest Service in his Forest Atlas of the National Forests of the United States.

After the publication of its Twenty-First Annual Report, 1899 – 1900, the Geological Survey’s examinations and mapping of the forest reserves found a new outlet in the Survey’s Professional Papers series, launched in 1902. Thirteen early numbers of Professional Papers were dedicated to an assessment of the forest conditions found in states, regions, and for individual forests between 1902 and 1905. For instance, in the Northern Region, Professional Paper No. 29 and Professional Paper No. 30, both issued in 1904, examined the Absaroka and the Little Belt Mountains Forest Reserves respectively in Montana. Maps illustrating these reports are found under these two forest reserves.

The thematic maps produced by the U.S. Geological Survey in both its Annual Reports and its Professional Papers series, often become separated from their parent publications, and so, it is hoped that by providing full citations for each map and including in that citation a full description of the parent report, a researcher can, if necessary, unite map with text. Much of the color thematic data found in the forestry reports of the U.S. Geological Survey as well as the topographic information later made its way onto the future pages of the Forest Atlas series.

The Geological Survey left a large and remarkable body of written, photographic, and cartographic work on the early forest reserves for today’s researcher. The bureau’s forest mapping legacy is listed in its entirety organized within each Regional Chapter. Henry Gannett, in charge of the U.S. Geological Survey’s Division of Geography and Forestry summarized his Division’s efforts in the agency’s 1905/06 annual report:

“During the spring [of 1905] the work of examining forest reserves, etc., together with the men employed upon it, was transferred to the Bureau of Forestry of the Department of Agriculture. As this closes the work of the Geological Survey in the examination of forest lands, it may be well to make a brief résumé of the results accomplished. The work was committed to this office by act of Congress in 1897, and has therefore been carried on for eight years.”

Gannet then provides a state by state listing of the 34 forest reserves that had been examined and which had reports written as well as the often stated lament that: “The names [of the forest reserves] given above are in most cases those which were in use at the time of the examinations. Many of them have

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since been changed through consolidation.”7 He continues, “Besides these reserves, large areas were examined with a view to the formation of new reserves or their inclusion in existing reserves. The total area examined during the eight years amounts to 110,000 square miles.”8

Even after the transfer of responsibility for mapping the forest reserves to the Forest Service in 1905, the Geological Survey continued to make mention in its annual reports where topographic surveys were being conducted in areas wholly within the forest reserves and in areas where the U.S. Geological Survey was engaged in forest boundary surveys. The Survey’s 1906/07 annual report, for instance, noted that topographic surveys were being conducted on the Priest River Reserve in Idaho, the Hellgate Reserve in Montana, and for a proposed reserve in Idaho in that state’s Kootenai and Shoshone counties, along with describing topographic work accomplished in several other western states.9 These surveys later resulted in the publication of topographic quadrangles by the Geological Survey, conforming to the geographic grid and not to forest reserve boundaries. Along with its topographic work, the Geological Survey was also instrumental in surveying and marking the boundaries of the Forest Reserves. Such boundaries later appeared as important lines on the agency’s published topographic maps and on Forest Service maps as well. Henry Gannett, writing in the 1906/1907 annual report, stated that during the past year, one of his duties as Chief Geographer of the U.S. Geological Survey was “Assisting the Forest Service, particularly in matters relating to geography and topography and in the organization of its reserve force.”10 Also, Henry Gannett was assisting Gifford Pinchot, F. E. Olmstead, and Coert DuBois in organizing the western forest reserves into administrative districts also called “inspection” districts, the precursors of the Forest Service regional organization.

The Geological Survey’s Annual Reports and Professional Paper series are readily available in most major university, public libraries, and state historical societies. These book publications were widely distributed through the Government Printing Office’s depository library system as well as included in the Serial Set of United States government publications.11

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7 Ibid, p. 160.
8 Ibid, p. 160. 110,000 square miles = 70,400,000 acres.
10 Ibid, 54.
11 See the excellent index to all maps included in the Serial Set, including forest maps by the Geological Survey, CIS US Serial Set Index, Part XIV, Index and Carto-Bibliography of Maps, 1789-1969, edited by Donna P. Koepp, (Silver Spring, Md.: Congressional Information Service, 1995).
Illustration 1: Southern portion of the Plate 1 “Map of San Francisco Mountains Forest Reserve, Arizona, showing classification of lands” made to illustrate, Leiberg, John B., Theodore F. Rixon, and Arthur Dodwell, Forest Conditions in the San Francisco Mountains Forest Reserve, Arizona. (Washington, D.C.: Government Printing Office, 1904). U.S. Geological Survey Professional Paper No. 22. Data from this map (land classification, forest type and density, etc.) were later used for the prototype for the Forest Atlas of the National Forests of the United States series as described below. Flagstaff, Arizona can be found in the center of the map surrounded by pink or “Cut Timber” land classification.

3. Proclamation Diagrams and Executive Order Maps

Until the fall of 1905, the boundaries of newly created forest reserves were expressed in the text of the Presidential Proclamations according to the public land survey system of the General Land Office – numbered townships north and south, and numbered ranges east and west according to meridians and baselines established for the area by G.L.O. surveyors. These descriptions could be quite lengthy, some taking up to three or more pages. No map accompanied these early proclamations. However, Forest Service cartographers, retrospectively, took the public land descriptions from these proclamations and, by hand, drew boundaries and boundary changes onto copies of the early G.L.O. maps of the forest reserves, or onto G.L.O. state maps, and retained these maps in the agency’s “Boundary Atlas” map files, now in the possession of the National Archives. President Theodore Roosevelt issued the first published presidential proclamation for a forest reserve with a “diagram” or map attached on October 12, 1905 creating the Jemez Forest Reserve in New Mexico, now the western portion of the Santa Fe National Forest. The addition of a map/diagram to the proclamation eliminated the need for the lengthy public land narrative description of the forest reserve boundary. General Land Office maps served as the base maps for these map/diagrams, and thus almost all of these early map diagrams were devoid of any detail,
as in the 1905 example supplied below of the La Sal Forest Reserve along the Utah/Colorado border. Once the Forest Service initiated their own cartographic data gathering, later proclamation diagrams and executive order maps after the year 1908, include much more detail. After 1912, they are on a par with any separately published administrative forest map for the time. In two instances, proclamation diagrams compiled for California’s Cleveland and Sierra National Forests dated 1915, showing land eliminations were re-issued as folding forest visitor maps the same year. Presidential proclamations and their diagrams printed at a reduced size also appeared in the volumes of the United States Statutes at Large; texts and maps of presidential Executive Orders do not.

Citations found in the cartobibliography for maps (“diagrams”) accompanying proclamations are for those that are separately published and not for those page-sized maps reprinted in the U.S. Statutes at Large. Executive order maps, since they were not reprinted in the U.S. Statutes at Large, are all described as issued. Early proclamation diagrams and executive order maps were prepared by the Forest Service, but engraved and printed by the U.S. Geological Survey in press runs of just over 1000 copies each. In a letter from the Geological Survey’s Chief Engraver, Stephen J. Kubel to the Fred G. Plummer, the Forest Service’s Geographer, dated July 6, 1908, Kubel informs Plummer that “The following sheets are printed and boxed, and are ready for shipment, 500 to go to the State Department and the balance to your office. Kindly have your wagon call for them as soon as possible.”

The Department of State received 500 copies because it was responsible for issuing and recording presidential proclamations and executive orders, and had, by 1907, established a formal numbering system for both kinds of presidential actions. The remainder of the print run was sent on to the U.S. Forest Service, often with an overage for waste of about 20 copies each.

As time went on, the number of maps illustrating presidential proclamations and executive orders fell dramatically, most likely due to cost. Their existence became the exception rather than the rule, quite unlike the early period between 1905-1920 when such maps accompanied just about every proclamation and the many executive orders. Most proclamations establishing new national forests in the east and south in the 1930s only had sketch maps to illustrate their boundaries or had reverted to a narrative of township, range, and section numbers in public land states to describe boundaries as in the period 1891 to 1905. A few proclamations simply noted that a map was on file in the offices of the Forest Service. When in 1942 the Public Land Order was initiated in lieu of presidential actions, accompanying maps vanished. Public land descriptions took their place. Proclamation diagrams and Executive Order maps are important early examples of Forest Service cartography that should not be overlooked by the researcher. They provide the first boundary information on newly established forests and indicate subsequent boundary adjustments as well as land eliminations and additions to existing forests to fulfill Forest Service policies. They should be used with the understanding that the public land survey system (PLSS) grid, on which they are based, were, in many instances, constructed by merely projecting the PLSS grid from known survey lines into mountainous and remote areas that had not yet been adequately surveyed by the General Land Office.

12 Kubel to Plummer,, 1908, RG 95.4.1, Records of the Engineering Division, Forest Service.
Illustration 2: Proclamation Diagram establishing the La Sal Forest Reserve in Utah and Colorado on January 25, 1906. The Forest Service compiled the map in 1905 by splicing together 18 General Land Office plat maps (1:63,360-scale plat maps covering 36 square miles, or one Township each). The entire Proclamation consisted of the “Diagram” and the text with the President’s signature.
4. “Type & Title” Mapping by the U.S. Department of Agriculture

Pinchot wrote in the first edition of his “Use Book” that “In 1903, the need of better choice of reserve boundaries led to the establishment of a force of trained men devoted exclusively to this [boundary] work, under a uniform and complete system of field study and report. The results were satisfactory, and the system remains in effect. Before any new forest reserve is created, or any change is made in the boundary of an existing reserve, a member of the Forest Service familiar with the work and with western conditions makes a careful investigation not only of the lands, but also of the interests involved.”

The “force of trained men” were of course the “Forest Arrangers” like Elers Koch, as described in the administrative history found on this web page. The Foresters in the Department of Agriculture’s Division of Forestry (after 1901 the Bureau of Forestry) were responsible for examining the reserves. Establishing boundaries, evaluating resources, and investigating forested areas in the West for potential new forest reserves became a high priority for the Bureau headed since 1898 by Gifford Pinchot. Again, Pinchot: “Most of the forest reserves created since January 1, 1904, were examined and mapped by the Forest Service. These maps were made in duplicate on a scale of one-half inch to the mile [1:126,720-scale]. One showed the classification of lands and the other the patented and entered claims. These type and title maps, as they are called, will be furnished to every supervisor and as rapidly as possible to every ranger. Blank prints [without thematic information and used by rangers in the field] are available now for distribution among the reserve officers and the supervisor will be responsible that his rangers are furnished with adequate maps of their districts.”

The type and title maps created by Pinchot’s trained men were in almost every case, drawn on a General Land Office base annotated in applied color, as for example, these two manuscript maps held by the National Archives:

**Bear Paw Forest Reserve, Montana.**
Forest Service, U.S. Dept. of Agriculture; base map in part from G.L.O. maps.
Shows boundaries of the proposed Bear Paw Forest Reserve along with the boundaries of Fort Assiniboine Military Reservation, roads, trails, ranches, and streams. “Montana Principal Meridian.” National Archives has two copies of this map both with hand-applied color showing, land use and vegetation (Type) on one map and, on the other, land ownership status (Title).

Most of these type and title maps of the forest reserves mentioned by Pinchot are found in the National Archives “Boundary Atlas” files. Many have hand drawn boundaries illustrating proclamations from this early (1891 to 1905) period. Each forest supervisor was given the responsibility to keep the type and title maps made for their forest up to date and report any corrections to the Washington office. These maps were never distributed to the public and so are quite difficult to locate, but their construction, the information they depicted, and the methods used to update them became the basis for the Forest Service’s first major mapping project, the *Forest Atlas* series.

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15 The Bear Paw Forest Reserve was never proclaimed due to the fact that far too much forest land within its proposed boundaries was no longer owned by the federal government.
5. Forest Atlas of the National Forests of the United States

In his Annual Report to the Secretary of Agriculture for the fiscal year 1906/07 and published on December 3, 1907, Gifford Pinchot wrote to Secretary of Agriculture, James Wilson:

“During the year a radical change was made in the methods of recording, classifying, and making available for reference upon maps the information concerning the forests of the country, and especially the National Forests, gathered by the Service. A scheme was adopted which improved and standardized the methods employed, both in field and in office work. By the use of graphic symbols like those of the U.S. Geological Survey and the Coast and Geodetic Survey, record is made of the character of the land and of the forest, its ownership, grazing conditions, and other matters. To take charge of the maps on which appear the data thus gathered and to keep them always up to date, a special section, that of “The Forest Atlas,” was created.”

“Folios of the more important Forests are being printed for the use of the field men. Others are duplicated by photography, and copies are furnished to supervisors. The work of preparing these maps of the National Forests was done in cooperation with the U.S. Geological Survey, which already had carefully prepared topographic maps of much of the country now included within the National Forests.”

The mapping plan envisioned by Pinchot was “radical” in the sense that the new section on his organization chart called “Atlas” was attempting a task no less ambitious than to compile a complete set of standard maps in portfolio for each national forest which carried all the information needed by the supervisor and ranger to fulfill their managerial duties. The plan must have appeared at the time as tremendously ambitious since many of the new national forests were located in the most isolated and unmapped areas of the west. However, the idea and scope of the project was not entirely unprecedented. An earlier, first expression of a similar atlas project can be found in John Wesley Powell’s Geologic Atlas of the United States, originally planned as one atlas for each topographic quadrangle. Powell’s Geological Atlas, published in 227 folios between 1894 and 1945, included a descriptive text, topographic reference map, geologic map, geologic cross-section sheet, and, if warranted, underground maps of mines and information on mineral resources. Indeed, Pinchot’s Forest Atlas and Powell’s Geologic Atlas measured the same at 21 inches tall and 18 inches wide, with title, agency name, and an index map giving the location of the area covered in the atlas on the front panel. The Geologic Atlas had maps bound in; the Forest Atlas was unbound, because Pinchot’s plan called for the atlas to be continually updated. The idea of a Forest Atlas also appealed to Pinchot’s and the Progressive Era’s belief in what has been called the “Gospel of Efficiency,” in that his vision of the Forest Atlas called for all spatial and thematic information needed by his bureau to carry out their duties was to be found in one publication and kept current by professional foresters in the field. It was not only an efficient administrative tool, it also fit into Pinchot’s decentralized organizational model: professional forest service staff at the local level objectively acting on real forest conditions, while informing a central administrative office, which supplied standards and support services.

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The existence of a single atlas sheet for the San Francisco Mountains National Forest held by the American Geographical Society Library at the University of Wisconsin, Milwaukee indicates that the Forest Service and Pinchot sought input from respected scientists of the time on the content and format of the proposed *Forest Atlas*. This sheet has not been found in any other library or repository. The AGS example has a note that reads, “Acquired by Gift Jul 16, 1921 from Dr. I. Bowman” that is Dr. Isaiah Bowman (1878-1950), director of the American Geographical Society from 1915 to 1935 and author of the landmark work, *Forest Physiography* (New York: Wiley, 1911). Ink handwriting on this sheet states, “Part of Forest Atlas of U.S.A. (issued for use of Forest Officers only)” and on the back of the sheet in crayon, “Forest Atlas Sample Page.” Extensive typescript descriptive notes on the sheet address map standards, suggest ways to deal with non-conforming legend symbols, and the general size of sheets. This format, coverage, and symbols shown in this single sheet later became the standard for every sheet that followed in the *Forest Atlas* and indicates that Pinchot sought expert advice and comment from the scholarly community before launching his radical mapping project for the national forests. A full descriptive citation of this review sheet is provided below:

1907. Scale, ca. 1:63,360. W112°22′ – W112°10′/N35°05′ – N35°20′. Public land (Township Range) grid. Color, 1 numbered sheet without portfolio, 54 x 46 cm. Relief shown by contours and spot heights (contour interval 250 feet).

Shows national forest and county boundaries, towns and settlements, roads, trails, railroads, Forest Service facilities, rivers, lakes, and streams. General land classification shown in color and the type of alienated land within national forest boundaries shown by letter, both keyed to a separate legend sheet. Sheet is titled, *San Francisco Mtn’s.* and designated as [sheet] 5. Map is centered on the Bill Williams Mountains, provides coverage of Townships 20, 21 & 22 North, and 1 & 2 East, Gila and Salt River Meridian, and includes the town of Williams, Arizona.

Even though the U.S. Geological Survey ceased to have responsibility for examining the forest reserves after 1905, its staff of cartographers and engravers continued to work with the Forest Service on the compilation and printing of the multi-sheet 1:63,360-scale *Forest Atlas*. In its 1910 Annual Report the Survey’s Topographic Branch reported that in order to compile the *Forest Atlas of the National Forests of the United States*, “All the work of the United States Geological Survey, the General Land Office, and the Hayden Transcontinental [1867-1878], and Wheeler surveys [1869-1879], as well as work done by the Forest Service, was incorporated in these maps. The Forest Service furnished the status of all lands inside forest boundaries. Where the timber classification was considered up to date, it was shown in color on the maps.”

Henry Gannett provided more information about the atlas project, now that certain procedures had been put in place, in the 30th Annual Report of the U.S. Geological Survey: “The work of preparing the folios of the atlas of the national forests was continued under the direction of A[rthur]. C. Roberts. The maps

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18 Fred G. Plummer Chief of Geography for the Forest Service wrote to Frank Pooler, District Forester for District No. 3 (Southwest) transmitting “one advance folio of San Francisco Mtns. which is no longer needed at Washington and may be disposed of or destroyed as you think best.” Fred G. Plummer to Frank C.W.Pooler, October 25, 1909, RG 95.4.1, Records of the Engineering Division, Forest Service.
19 Thematic information on forest type and density was readily available in the U.S. Geological Survey’s *Professional Paper* No. 22, “Forest Conditions in the San Francisco Mountains Forest Reserve,” (Washington: Government Printing Office, 1904).
were made on the scale of 1 mile to the inch and published with 6 townships to the page.”

Many of the folios were published only in a black & white edition, without thematic timber type, density, or land classification, either because there was no such information available at the time of compilation or the thematic information was out of date. The same was true for topographic information, which was added to the atlas sheets only when available. It was decided that thematic information could be applied on the black & white maps by the foresters in the field at a later date. In fact, each folio sent to the District headquarters for distribution included a set of colored crayons corresponding to the colors used for timber density. The Survey’s role in compiling the Forest Atlas of the National Forests of the United States ended in 1910. Mary C. Rabbitt in her history of the U.S. Geological Survey wrote that in 1910, “A disagreement with the Forest Service about control of the work led the Survey to discontinue the preparation of the atlas of the national forests. Folios of 36 forests had been completed; four partly finished folios, on Director [of the U.S. Geological Survey George Otis] Smith’s orders, were turned over to the Forest Service.”

However, because the Forest Service lacked its own printing facility, the Geological Survey continued to prepare plates and print new editions of the Forest Atlas well into the 1920s.

The Forest Atlas of the National Forests of the United States comprises over 5,000 atlas sheets in 156 individual National Forest titles and 28 variant editions, with some 3,800 black & white and colored sheets produced between 1907 and 1910 alone. Each folio was separately sub-titled and contained map sheets covering one national forest. Folios for the Luquillo (Puerto Rico) and the 1907 Wichita (Oklahoma) National Forests have only one oversized sheet in folio. The largest folios were the Lewis & Clark National Forest in Montana at 56 sheets and the Blue Mountains National Forest in Oregon with 50 sheets. The first folios came off the presses in 1907; the last, the third edition of the Caribou National Forest atlas for the Intermountain District (4) was issued in 1929. As administrative boundaries shifted or as larger forests were divided into new, more manageable forests, atlas sheets were reshuffled into new combinations, such as the Nez Perce Folio of 1909 or the Deschutes Folio of 1910. When two or more forests combined to form another, as in the case of the Angeles National Forest, the result was that the Folio had two numbering systems. Ten atlas sheets were made for the San Gabriel National Forest and another ten for the San Bernardino National Forest, both sets were numbered 1 to 10. In 1908, when the two forests were combined into the new Angeles National Forest, the two separate folios were in the final preparations for printing. It was too late to change the numbers on the sheets, but a new folio folder was designed for the Angeles National Forest atlas resulting in its map index and its map sheets carrying two separate numbering sequences. The forest atlases were being compiled during a time of rapid reorganization of the national forests between 1907 and 1910 and atlas compilers were constantly confronted with the unsettled nature of national forest names and boundaries.

A colored legend sheet came with each atlas folio whether or not the atlas sheets themselves were issued in a colored edition. The legend indicates with various colors, five classes of timber densities, six other land cover classes, three types of burned over lands, windfalls, bug infested timber, three types of old cut-over areas, three types of timber sales areas, cultivated land and irrigated lands. Tree species are also identified. Courtesy of the General Land Office, the atlas sheets show 14 different types of land entries, such as cash and desert entries, state lands, and the limits of railroad and wagon road land grants, as well as “in lieu” lands granted to states as compensation for state school sections within national forest

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boundaries. Atlas sheets show four types of mining claims together with the claim’s four-digit file number. File numbers can then be taken to find the text of the actual claim.\(^{23}\) In regards to alienated lands within national forest boundaries, most map sheets identify landowners by name. And from various topographic surveys, contour lines were transferred onto atlas sheets whenever they were available. Finally, the legend has conventional signs for a wide array of cultural features, such as boundaries, roads and trails, telegraph/telephone lines, structures, and all manner of forestry related improvements, like skidways, flumes, log driving routes, and sawmills. The colors and symbols found on the legend sheet applied to all forest atlases. The legend sheet later formed the basis for the standardized symbols used by the Forest Service for its administrative maps.

A separate atlas series and legend sheet for grazing purposes was begun according to the same plan at about the same time as responsibility for the compilation of the Forest Atlas was transferred from the U.S. Geological Survey to the Forest Service. Few grazing atlases were compiled; most being made between 1910 and 1914 for range lands in Idaho, Montana, Wyoming, and northern Arizona and were initiated by the District Office to meet the District’s needs. Most are quite incomplete, but are listed here whenever encountered.

At the height of Forest Atlas production, in December, 1908, the Assistant Forester, C.S. Chapman, sent a letter to all District (Regional) Foresters informing them that the Forest Service’s Office of Geography was preparing a history of the national forests to be included with the forest atlases then being issued. Chapman wrote to the Foresters,

> “It is evident that much of the information required for this work must be secured through such personal knowledge of local conditions as only the officers in direct charge of the Forests are in a position to obtain. I will, therefore, be very glad if you will take this matter up with each of your Supervisors and secure from them the necessary reports upon their Forests, and forward the reports this office before the first of February [1909], if possible. In order to assist you, I have sent you, under separate cover a supply of a form of Report, entitled, Report for Forest Atlas indicating in a general way, the substance of the information desired. I will also send as soon as possible, copies of a bulletin containing a History of the Teton National Forest which will serve as a sample sketch.”\(^{24}\)

In response, William B. Greeley, then the District Forester for District No. 1, sent a letter to his forest Supervisors later that month asking that historical information on native inhabitants, early explorers, settlement, major fires, economy, etc. be gathered by the rangers in the field. Along with this request, Greeley sent what he called a circular entitled, Report for Forest Atlas.\(^ {25}\) Unfortunately, no Forest Atlas could be located anywhere that included a national forest history, nor could a history be found that was published separately and issued for the Forest Atlas. Perhaps the press of ordinary business dictated that this call for a history of each national forest to be included in every Forest Atlas became a low priority for forest Supervisors. Such historic information on the early history of the national forests would have proved invaluable not only for the Forest Service itself but for many others throughout the 20th century through to our times. It is possible, but there is no way of knowing, if the historic information called for by Assistant Forester Chapman in 1908 was actually written and saved, and later found its way into the text on forest visitor maps.

\(^{23}\) Staff members at the National Archives have reported that researchers interested in mining claims have been, by far, the heaviest users of their set of forest atlases.

\(^{24}\) C.S. Chapman to William B. Greeley, December 4, 1908, RG 95.4.1, Records of the Engineering Division, Forest Service.

\(^{25}\) William B. Greeley to District 1 forest supervisors, December 22, 1908, RG 95.4.1, Records of the Engineering Division, Forest Service.
This singular achievement in the history of federal mapping has gone almost completely unrecognized because the atlases were never allowed to be released to anyone other than Forest Service employees. Pinchot in his monthly staff publication “Field Program for January, 1908” (issued December 31, 1907) that:

“Forest Officers are cautioned that the Forest Atlas Folios, which are being issued as rapidly as possible, are confidential records for the use of the Service only, and under no circumstances are to become the property of or be loaned to people outside of the Forest Service.”

The 1912 booklet, Instructions for Making Forest Surveys and Maps, issued by the Office of Geography also prohibited Forest Service staff from sharing pages of the Forest Atlas Folios with the public:

“Whenver Forest Atlas folios have been duplicated by photolithography or otherwise for a National Forest, the officers have been supplied with copies, but under no circumstances are copies of any atlas folio be sold or given away. They are strictly for the use of forest officers in the administration of the National Forests. Copies for distribution are not published.”

And a note inside the Forest Atlas of the Wichita National Forest of 1907 held by the American Geographical Society acquired from the Forest Service’s Washington, D.C. January 31, 1921, states that, “Forest Service cannot supply us with copies of other Nat. Forests in this form – issued for use of Forest Officers only.” So even into the 1920s, Forest Atlases were still being withheld from public view.

The Forester did not explain the reasoning behind the order to keep the atlases from the public, but one must assume that the atlases carried sensitive and/or proprietary information (mining claims, names of land owners, locations of the best stands of timber, etc.) that the Forest Service did not want to make generally available. The result of the policy has been, however, that the atlases have never been fully examined and brought to the attention of modern day scholars and researchers. The most complete collections of these atlases are held by the National Archives in College Park, Maryland, the National Agricultural Library in Beltsville, Maryland and Yale University’s Graves Forestry and Environmental Sciences Library. Large, but not fully complete, sets of atlases can be found at the University of Wisconsin Milwaukee Libraries, American Geographical Society Library and at the Geography and Map Division of the Library of Congress in Washington, D.C. The set of atlases held by the Geography and Map Division (G & M) has some large gaps in its collection, noticeably folios for the forests of the Pacific Northwest. This might be due to the fact that the G & M collection was formerly a working set transferred during World War II from the offices of the Forest Service in Washington, D.C. The American Geographical Society’s collection consists of about half of the atlases printed and were transferred to the Society in the spring of 1935 by individual Foresters in Regions 1, 3, 4, 5, and 6 about the time when the Forest Atlases ceased to be used in the administration of the national forests, when new forest type maps were being compiled and printed, and when the Forest Service began to use aerial photography as its primary tool for resource inventory and management. A few atlases have made their way into academic and historical society libraries as gifts or bequests from former employees of the Forest Service and their families, such as the Umpqua Folio pictured below held by the University of Oregon Library. Other collections may be found in some regional offices of the Forest Service such as Region One in Missoula and in a few state historical societies.

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The U.S. Geological Survey printed the folios of the *Forest Atlas* in limited quantities. In a letter from Fred G. Plummer to Arthur C. Roberts of the Geological Survey, 1907, Plummer asks that “Unless otherwise specified, please print 200 folios of each of the National Forests which you have under preparation, and in all cases where classification is to be shown, one-half of the edition will be colored and the other half black base maps.” Where colored land classification information was not available, the Geological Survey was instructed to print 200 copies of each the *Forest Atlas*.\(^{27}\) Information on the distribution of the 200 copies has not been locates, but from known distribution of Forest Service maps, one can gather that quantities of atlases were shipped to Forest Service offices in Washington, D.C. where a few copies were held, while most were then sent on to Foresters in the District Offices and to Forest Supervisors who were charged with keeping the atlas folio up to date. Here is the typical distribution letter from Fred G. Plummer addressed to Forest Supervisors:

Mr. V. Gifford Lantry
Absaroka National Forest
Livingston, Montana

Dear Sir:

There has been forwarded to you from Washington a lithograph edition of the Absaroka National Forest Folio of the Forest Atlas, together with such extra sheets as were received from the engraver.

The sheets comprising this folio were compiled from the best data at hand and will serve as a working basis for a more accurate edition which may be issued at a later date. They are not for sale nor for distribution to the public, but are confidential records to be used by you and by your rangers in any way in which they will be of service.

At least once in three months you should forward to the District Forester sheets showing any corrections or additions according to the Atlas legend. Such data will be posted upon the District Atlas and forwarded to Washington, and will serve as a basis for a future edition, and in the meantime as a record of the available information.

Very truly yours,

[Signature] Fred G. Plummer
Chief of Geography \(^{28}\)

Every Region had a different experience with the *Forest Atlas*, because, before it could be fully completed, the program’s major advocate, Gifford Pinchot, left the Forest Service. His overall plan for the *Forest Atlas* -- professional foresters in the field being supplied with best available maps of their forest from Forest Service Headquarters; foresters noting changes and corrections to sheets from first-hand observation; revised maps being returned to Washington, D.C. for corrections and updating; new atlas sheets being printed with the new information and returned to foresters in the field -- still existed but it appeared not to be fully enforced largely because of Pinchot’s other vision of a decentralized administrative arrangement for the Forest Service. From the publication record, the Rocky Mountain, Southwestern, Intermountain, and North Pacific Districts simply did not continue with the plan at all. Others such as the Northern and California Districts (now Pacific Southwest Region) tried to keep their *Forest Atlas* series relevant and up-to-date, but did so to meet their own specific requirements apart from Pinchot’s uniform national plan.

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\(^{27}\) Fred G. Plummer to Arthur C. Roberts (USGS) August 3, 1907, RG 95.4.1, Records of the Engineering Division, Forest Service.

\(^{28}\) Fred G. Plummer to V. Gifford Lantry, April 20, 1909, RG 95.4.1, Records of the Engineering Division, Forest Service.
6. The decentralized administrative organization and its effect on early Forest Service mapping.

While singularly focused on the highly centralized mapping endeavor of compiling, printing, and distributing the folios of the *Forest Atlas*, Gifford Pinchot and his able Associate Forester, Overton W. Price, were moving the Forest Service’s overall administrative organization in a different direction, one that would become a hallmark of the agency. This was their concept of decentralization, which has been described by historian Robert W. Cermak:

“This concept recognized three important facts: the forest reserves differed widely from one another in resources, problems and opportunities; administration of the forest reserves had to be responsive to local needs for both practical and political reasons, and people work best when given responsibility for a job and the authority needed to get the job done.”

Cermak continues that decentralization embraced the practical goals of hiring the best people available, both experienced local woodsmen who had good standing in their communities and professional foresters, all governed by federal Civil Service rules, to manage the forests. Finally, it was important to provide a few but vital controls over field operations by issuing standards and policies in an overall supportive atmosphere from Washington. The principal of a decentralized administration was fully embraced by Pinchot’s successor, Henry S. Graves when he was appointed Forester in 1910 and has been a notable feature of the Forest Service ever since. However, when Graves assumed his post as Forester, most mapping was still done in Washington: “While a certain amount of drafting and map work is conducted in the district offices, and a small amount necessarily on the Forests, the greater part is concentrated in Washington for reasons of economy.”

The few centralized controls over local operations were expressed in such early publications as the *Use Book* and *National Forest Manual*. Controls clearly meant standardization and another important manual that provided standards was the *Instructions for making Forest Surveys and Maps* first published in 1907 with a second edition released in 1910. The first edition of the *Instructions* booklet served as a manual of surveying and map-making in the field. The edition of 1910 added a chapter on preparing sheets for the *Forest Atlas*. An enlarged third edition appeared in 1912 with a supplement, *Signs, Symbols, and Colors*, prepared by the Office of Geography. The third edition of the *Instructions* had grown to 85 pages over the second edition’s 51 not counting its supplement and represented a significant advance over previous editions of the map manual. This 1912 edition of the *Instructions* was an expression of the decentralization in Forest Service for cartography. “These simple Instructions are issued to members of the Forest Service in order that forest surveys and maps may be as nearly uniform as practicable.”

The 1912 *Instructions for Making Forest Surveys and Maps* allowed a certain measure of regional variation when it stated that: “It should be borne in mind that the National Forests are established in widely different regions; as far north as Alaska and as far south as Florida and Porto Rico. On no two forests will the data suggested on the legend page be of equal importance, and it may be necessary or convenient to adopt additional symbols or colors to show unusual conditions. This is quite

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permissible…”32 Forest Service mapping from the period 1910 to 1922 varied greatly from district to
district. District 1 produced a wide array of topographic maps and atlases but only one map specifically
for the forest visitor. In contrast, by 1918, districts 5 and 6 had produced many folded forest visitor maps
for the national forests in California, Oregon, and Washington, but only a few revisions to their sets of
Forest Atlases. Other districts issued a mix of administrative maps and forest visitor maps based on the
district’s needs. All districts produced administrative maps of individual national forests and all, to a
varying degree, relied on the Washington Office to compile their district’s maps. In short, each district
had the autonomy to respond to their local needs using their local resources in order to provide maps in
support of Forest Service staff in the field and to a lesser degree, for forest visitors. Assistance as well as
control was available from the Washington Office.

By 1910 with most forest atlases now complete and with responsibilities for their maintenance placed at
the district level, it became necessary for each district to recruit and hire cartographers and draftsmen
capable of making and revising maps as well as making township and control surveys in the field. In
Missoula, like other district foresters, District Forester William B Greeley began forming an Office of
Geography within the District’s Branch of Operation by hiring a recent graduate of the University of
Montana, Frank Edward Bonner, to be his Chief of Geography. Soon, another cartographer, Charles F.
Farmer joined the staff. Other cartographers and draftsmen followed. Another University of Montana
graduate, Frank J. Cool, along with James Blaine Yule and Kenneth Dupee Swan came on board shortly
after 1911. Together, the team of Bonner, Farmer, Cool, and Yule produced much of the cartographic
work between 1910 and 1920 for the Northern District. Their names appear on many Forest Atlas sheets
and individual forest maps for these years and beyond and signaled a transition to a time of less
dependence on the Washington Office for map compilation. Other Districts, notably the 3rd and 4th
Districts (later the Southwestern and Intermountain Districts respectively) still had most of their map
work done by the Washington Office. Districts 5 and 6 (California and North Pacific Districts) had
moved even faster than District 1 on hiring cartographers and draftsmen, compiling maps and atlas sheets
in house as early as 1911. By 1920, all district offices had a productive cartographic staff in place, now
working within a district Engineering Office, which continued to rely on Washington for map
reproduction and distribution services. Washington Office cartographers, who up to the early 1920s had
been filling in for cartographers and draftsmen yet to be hired in the Districts, became more involved
with making maps for the new national forests being proclaimed in the east. With consistent policies,
procedures and controls and with competent civil service cartographers on staff, as well as the ability of
supervisors to respond to local needs, decentralization had been fully realized in Forest Service map
making.

7. Defining a Cartographic Program: Forest Service Mapping, 1910-1922

With the 3rd edition of the Instructions in 1912, single sheet maps as well as proclamation diagrams
produced by the Forest Service from 1912 onwards began to take on a more uniform and distinctive
“Forest Service” look. The third edition now included an expanded page of “Conventional signs”
together with examples of bar scales, map corners, neat lines, and a standardized typeface. For the Forest
Atlas, a signs, symbols, and color legend sheet had been issued inside every folio, but not all Forest Atlas
sheets were compiled using standard line weights for borders and neat lines, uniform bar scales, or a
standard typeface. Compared to the maps made by the Forest Service after 1912 using the new standards,
the older and hastily constructed maps in the Forest Atlas exhibited a somewhat unfinished character.

32 U.S. Forest Service, Office of Geography, Instructions for Making Forest Surveys and Maps, 1912, (Washington:
The overall general appearance of Forest Service maps resulted from the adaptation of map features, functions, and symbols derived from mapping programs of other federal agencies. Between 1891 and 1911, three federal agencies had been responsible for mapping the national forests and each agency influenced the way in which forest mapping would evolve. The General Land Office mapping emphasized its Public Land Survey System of township range and section lines. The GLO had also adopted standardized engineering scales of 1:31,680 or ½ mile to the inch and 1:63,360 or 1 mile to the inch, for its maps and favored hachuring over contour lines to show relief. By 1910 the Forest Service had officially embraced the 1:63,360 scale as its own standard scale, and if smaller scale maps were called for, they were constructed in even multiples of that scale: 2 inches (1:126,720), 4 inches (1:253,440) or 8 inches (1:506,880) to the mile. Because ownership of the land was so essential to both the GLO and the Forest Service, every administrative map made and the vast majority of forest visitor maps for public land states would carry the Public Land Survey System grid lines. Forest Service maps generally used hachuring to depict relief. Topographic maps compiled by the Forest Service were the exception in the early years. When land exchanges grew in importance, land ownership information was added in the form of maps showing alienated lands. The PLSS grid outranked the geographic grid in importance in these early years of Forest Service cartography for even if the General Land Office had not yet surveyed areas of a given forest, the PLSS was projected into these area using dashed lines.

From the maps of the U.S. Geological Survey, Forest Service cartographers borrowed many of the Survey’s signs and symbols. Topographic, geographic, and elevation data from Geological Survey topographic maps were highly valued and used by Forest Service cartographers in administrative mapping. Topography expressed by contour lines enhanced a map’s usefulness, especially in fighting fire, planning timber sales, and building roads and whenever topography was available, contours were included on the sheets of the Forest Atlas. Forest Service cartographers also used the navigation charts of the U.S. Coast and Geodetic Survey as base maps for their early work on the Tongass and Chugach National Forests in Alaska and borrowed symbols from this chart-making agency as well. A few mapping symbols and even soundings crept into and remained on maps of the Alaskan forests from the Coast & Geodetic Survey for many years. To a certain but perhaps unknown extent, the maps produced by the Four Great Surveys of the West (1867-1879) influenced the final appearance of Forest Service mapping in that cartographers working on the Forest Atlas used these older maps to compile the atlas sheets in the absence of newer data. All of these influences can be found in varying degrees on the sheets of the Forest Atlas and later on the single sheet maps produced by the Forest Service.

As the agency began the first years of the new decade, Forest Service cartography was firmly based on the sheets of the Forest Atlas, which had been compiled using every obtainable map then available to staff cartographers. The folios of the forest Atlas were described in the 1912 Instructions manual with great respect:

“The folios are the “mother maps” which furnish the bases from which further map making will proceed in the Forest Service. They correspond to the mother maps of other countries in this respect – that they are compiled from official data upon a standard scale, 1 inch to 1 mile, and upon a uniform legend. They are not always sufficiently accurate for forest work, and the sheets must, therefore, be corrected whenever new data have been obtained in the field.”

Early Forest Service single sheet maps covering an entire national forest relied upon data found in the folios of the Forest Atlas – the mother maps. Only a few, however, indicate their source material. The

1912 administrative maps for the Sequoia, Malheur, and Siuslaw National Forests all do state their origins in the sheets of the *Forest Atlas*. In the case of the 1:126,720-scale map of the Siuslaw National Forest of 1912, its authority statement reads: “Compiled by assembling atlas pages corrected by the Supervisor, February, 1912.” This map includes information found on the sheets of the *Forest Atlas* for the Siuslaw National Forest from which it was derived, such as land and mining claims that would not appear on later administrative maps.

To illustrate this dependence on sheets of the *Forest Atlas*, the 1912 *Instructions* booklet prescribed the procedure to be used by the districts in regards to mapping:

> “General maps, showing an entire Forest or region are compiled at Washington from data on the corrected Atlas sheets, and are issued for the use of forest officers. The usual process is photolithography. Every request for the issuance of a map should be submitted to the Forester with a recommendation regarding the data to be shown or omitted, scale, kind of paper, and number of copies required. Any project for the issuance of a “three-color map” with blue drainage, brown contours, and black culture should be taken up by correspondence with the Forester before the final tracings are prepared in order that the manuscript may be in good shape for the engraver.”

Each Forest Service District could determine its mapping priorities, but Washington enforced map standards and arranged for engraving and printing services. Of the over 800 administrative maps produced by the Forest Service during the 1910-1924 period, approximately 54% were compiled by the Washington office with the remainder compiled by cartographers in the Districts. And of the 54% of maps compiled in Washington on behalf of the Districts, some 85% of these were made in the 1910-1916 period. After 1916, District cartographers were more often cited on Forest Service maps as the entity that compiled the maps while the Washington office continued to arrange for drafting and printing work. Because of the district’s early dependence upon the Washington Office for the compilation, editing, and printing maps needed in the field, map standardization was readily and rapidly adopted. The maps generated from the atlas folios quickly began to lose their unfinished appearance and took on a much more polished look with each passing year as symbols and type faces, corners, and neat lines were applied to every map being issued, including proclamation diagrams.

The Forest Service did not have its own printing plant and relied during this period almost exclusively on the engraving and printing services of the U.S. Geological Survey for its map production and, to a lesser extent, on the services of the Government Printing Office, both in Washington, D.C. In the Geological Survey’s *Annual Reports* issued from 1910 to 1920, the agency described the number of maps it produced on behalf of other federal agencies including the Forest Service under the activities of its Division of Engraving and Printing. After 1920, the Survey’s *Annual Reports* were reduced in size by about half and the in-depth reporting on printing done for other government agencies became merely a listing of those federal bureaus for which maps had been printed. The following table summarizes the printing activity performed by the Geological Survey on behalf of the Forest Service. The “Miscellaneous” category on the table below included maps printed for the reports of the National Forest Reservation Commission, as well as sheets for the *Forest Atlas*, and other atlases, such as the Forest Service’s landmark 1913 atlas *Geographic Distribution of North American Trees* and other special maps. The administrative maps listed are maps covering one entire national forest at the scales of 1:126,720 and 1:253,440. Quite often a “two-inch” and “four-inch” administrative map were issued simultaneously.

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Making a map at the same scale as the sheets of the *Forest Atlas*, 1 mile to 1 inch, for the most part, proved to be impractical due to the sheer size of the resulting sheet. However, this scale was used for smaller forests in the eastern United States and for topographic maps of ranger districts in the West. The table reveals an outpouring of administrative maps coinciding with the increased activity in the national forests during World War I.

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<th>Forest Visitor Maps</th>
<th>Proclamation Diagrams</th>
<th>Miscellaneous (Inc. Atlas sheets)</th>
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<td><strong>183</strong></td>
<td><strong>147</strong></td>
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</tbody>
</table>

*Table 1:* Maps printed for the U.S. Forest Service by the U.S. Geological Survey July 1, 1909 to June 30, 1920

Chart does not include approximately 20 forest visitor maps printed by the Government Printing Office 1910-1920

Quantities of administrative maps printed were quite small compared to forest visitor maps. Letters from District Foresters formally requesting maps usually included the number requested based on anticipated need, such as the request for 500 copies of the 1914 Pecos National Forest “fire map” and 2000 copies of the 1915 Gila National Forest “fire map” the following year. Turnaround time was rather fast. For instance, the District 2 Forester’s letter requesting 150 copies of an administrative map of the Arapaho National Forest dated November 9, 1911, was received in Washington on November 15th. The U.S. Geological Survey supplied the maps on February 21, 1912 and all were shipped to Denver on the 24th of February. Quantities requested increased over time due to increased demand.

It could be argued that the Forest Service began issuing maps for the general public as a fire protection measure after the disastrous fire season of 1910. The first separately published forest visitor maps, as opposed to Forest Service book-type publications with foldout maps bound into the text, appeared in 1913 (Illustration 4 & 5). In the U.S. Geological Survey’s annual report for fiscal year 1914 (July 1, 1913 to June 30, 1914), the Survey reported that it had produced “7 fire folder and tourist maps” and continued to refer to forest visitor maps in this way for two more years. For fiscal year 1917, the description changed to “recreation maps and fire folders” and, in the years following, simply as “recreation maps” despite the fact that the map format did not change. Through these maps and their texts, the Forest Service hoped to reduce the twin threats associated with having the public roam free in the national forests: the threat of fire and the threat of pollution of municipal water supplies by the inappropriate disposal of human waste. In his agency’s annual report for 1923, Forester Greeley restated the usefulness of the recreation map as a vehicle to communicate fire control information to the public: “A number of forest maps were also used for recreation folders, which, with printed information and fire

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37 Quantities and types of maps printed and distributed along with a record of correspondence can be found written by hand on many of the maps held by the National Archives and Records Administration for the period 1910 to about 1935.
precautions on the reverse side, are issued to the public.”

Text publications in the form of bulletins and circulars as well as tourist maps helped to educate the public on fire and sanitation issues.

District 5 led the way in the production and distribution of forest visitor maps, no doubt due to the fact that fire control was given top priority by Coert DuBois, the District Forester from 1911 to 1919. Previous to being named District Forester, DuBois, in his 1911 essay, *National Forest Fire-Protection Plans*, suggested that Forest Service rangers establish a camper’s registration system located at ranger stations or along the main traveled roads leading to camping grounds as a fire-preventative measure.

“It has been found in California that the names and plans of campers are easily secured if only the ranger has something to give in exchange. Camper’s maps have therefore been prepared showing roads, trails, meadows where feed may be obtained and other data of interest to the camper. Rules for care with fires and a short summary of the game and fire laws are printed on the margin of the map. The fact that his name, address, and destination are on record with the ranger is no slight restraint to prevent a camper from being careless with his fires.”

When DuBois became District Forester later that year, he put into effect his suggestions by instituting camper registration at forest camps and launching a series of detailed maps of California forests for the recreational user. The 1915 booklet, *Handbook for Campers in the National Forests in California*, large portions of which serve as a fire-prevention manual, advertised that “Maps are published of many of the National Forests, showing in some detail the roads, trails, and streams, and giving information regarding distances, camping grounds, etc. These maps may be obtained free on application at any Forest service office.” Indeed, by 1918 every national forest in District 5 in California, except the coastal Monterey National Forest, had a large-scale folded forest visitor map published and available to the public free of charge. Other districts could not match District 5 in this regard, although District 6 came close during this period. All forest visitor maps from 1914 to 1918 had a similar unadorned appearance, issued without illustrations and primarily at the scale of 1:253,440 (see Illustrations 4 & 5, 6 and 7). Maps were also issued at the scale of 1:126,720 and frequently required two sheets to cover one forest. The maps had a descriptive text, fire prevention instructions, tables of distances, vicinity maps, and often included hunting laws, hunting seasons and information on state agencies issuing hunting licenses. Unfolded, maps of District 5 national forests used red and green overlays to show thematic information useful to those groups mentioned in the map’s cover title, namely, hunters, campers, tourists and mountain travelers. The Inyo National Forest map of 1917 was typical (see Figure 4). Shown in red, were symbols for roads, post offices, areas of geographic interest, “particularly attractive” campsites, and large letters “S,” “G,” and “R” standing for places where one could obtain Supplies, Gasoline, and Ranches where butter, eggs, milk, etc. can be purchased. Lastly, over Mono Lake, the map reader finds written in red, “Ducks.” In green, large letters “P,” “G,” and “M” standing for locations where one can obtain Pack and saddle stock, can find a trail Guide, and a Meal. Other symbols show four types of stock meadows, good fishing streams, and stocked streams or lakes. And on some of California forest maps, the Forest Service was not afraid to simply write “unexplored” over remote areas. Other than those maps of California forests, the forest visitor maps issued by districts 2, 3, 4 and 6 were most often closely associated with an urban area, such as the maps of the Pike National Forest near Denver, the Pecos National Forest near

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Santa Fe, and the Cache, Uinta, and Wasatch National Forest close to the bench cities of Utah. These maps set a high standard for information delivery for the time and now serve as a remarkable window to the pursuit of outdoor recreation in the national forests during the early part of the 20th century.

In 1918, the Washington office compiled and the U.S. Geological Survey printed a uniform map of each of the six Forest Service districts of the West in two editions; one with and one without a highway overlay. District 5 composed text for the verso of the map and had it printed and folded for the public, the first such map to include photographic illustrations. But other districts did not follow California’s example. After 1918 and until about 1924 the uniformity of forest visitor maps ended as national forest districts produced a wide variety of non-standard maps and publications for their users with more printing done by the Government Printing Office. District 5 created a series of small-scale road maps for the national forests of California similar in size and format to the “in and out” maps that the Southern California Automobile Club published at the time for western cities (see Illustration 7B). This series used the common title of “Automobile Route Map of the... National Forest or Forests” as the case may be, on the map’s title panel. All were printed on a sheet 20 x 27 cm., tri-folded to 20 x 9 cm. by the Government Printing Office in 1919. The maps represented a significant departure from the large-scale folded forest visitor maps published between 1914 and 1918. Districts 3, 4, and 7 each issued recreation maps covering their districts as a whole, as in the 1922 map, National Forests, District 3, Showing Main Highways, or a large portion of their territory, such as District 4’s Recreation map of the National Forests of South Central Idaho also issued in 1922. In 1919, District 2 issued nine forest visitor booklets for its national forests complete with text, photographs, and a sketch map folded and inserted at the back of the booklet, all printed by the Government Printing Office (see Illustration 8). These booklet style publications were later expanded and improved during the 1930s and 1940s. District 6 also produced a number of booklets with maps for the forest visitor folded inside the back cover. These were included in the Department of Agriculture’s, Departmental Circular series as “Contribution from the Forest Service.” Finally, the Northern District produced a series of four, 1:500,000-scale “Quadrangle” maps for the public covering the heart of the northern Rocky Mountains between 1922 and 1924.
Illustration 4: Examples of Forest Visitor maps issued in the decade of 1910-1919. The first is the 1913 Oregon National Forest Map (later the Mount Hood National Forest) made at the District Office in Portland, Oregon; the Payette National Forest dated 1914, the Boise National Forest of 1917 and the Northern Half of the Inyo National Forest of 1917. The Idaho and California forest maps were compiled in the Washington, D.C. office. All had text on their versos describing fire safety, game laws, and other information for forest users. The U.S. Geological Survey printed all four. None were illustrated and their cover panels were simple and unadorned.
Illustration 5: Title and compilation information from the upper left portion of the unfolded 1913, 1:253,440-scale map of the Oregon National Forest (folded map shown in Illustration 4 above) showing signatures of the cartographers and the area between Portland, and Bonneville, Oregon. The U.S. Geological Survey printed 5,050 copies of the map. Hand annotations on the National Archives’ copy reveal that the Forest Service referred to these early folded maps as “Fire maps.” Indeed, the text on the map’s verso in large part is dedicated a discussion of forest fire prevention, laws, and penalties. This map was compiled and mapped by R.S. Shelley, the Deputy Forest Supervisor on the Oregon National Forest and revised March, 1911 and January 1912 by William B. Osborne, Jr. Both their signatures appear on the map. Finally, the map was corrected in the District Office, Portland in April of 1913.
Illustration 6: Legend for the 1913 Oregon National Forest Map showing types of information depicted on map. The map reveals its heritage in the sheets of the Forest Atlas in the four different pattern overlays showing land alienations and claims, features later either eliminated or shown with color.
Illustration 7: Map covers for the highly detailed 1918 Santa Barbara National Forest Recreation Map published at 1:126,720-scale in two sheets (East & West halves) “A” and the 1919 Automobile Route Map for the Klamath National Forest “B” published with a scale of about 1:2,250,000. The text written for each map promoted fire safety in the national forests of California.
Illustration 8: An example of a front cover of the booklet-type forest visitor publication issued in 1919 by District 2 for nine national forests in the District, plus one uniform to the series for the Superior National Forest in Minnesota, which, at the time, was part of and administered by District 2. Printed by the Government Printing Office, the booklets included a map of the forest inserted behind the booklet’s back cover. The Holy Cross National Forest was discontinued in 1945 and all its lands transferred to the White River National Forest.
8. Forest Service Mapping Between the Wars, 1922-1941

For the first time beginning in 1922, the Forester included a section in the annual reports of the Forest Service dedicated to agency cartography in a section captioned, “Maps and Surveys.” Until 1941, when the Forest Service along with the rest of the federal government transitioned to a war footing, this section charted the agency’s shift from its reliance upon traditional surveying and mapping techniques based upon ground methods in the early 1920s, to cartographic practices more and more reliant upon aerial photography. Paper administrative maps in ever increasing quantities continued to be produced at the standard engineering scales, while the Forest Service, for the most part, settled upon a scale of 1:253,440 for its forest visitor maps. As the public made more use of the national forests for recreation purposes the Forest Service issued not only more fully edited forest visitor maps complete with text and photographs, but also more ephemeral recreation folders, especially in the 1930s. Sheets of the Forest Atlas continued to be produced to fulfill needs in the District Offices. The Forest Service’s 1930 annual report contains the last mention of any atlas sheets being produced, while, tellingly, the 1931 report was the first to optimistically state that two contracts were awarded to airplane companies to obtain mapping data required for the preparation of Forest Service maps and to support other tasks assigned to the agency.

Map accuracy steadily improved during this period even as Forester William B. Greeley lamented the fact that in 1922 only 20% of the national forest area of 181,799,997 acres was “accurately mapped.” In this he was addressing the need for precise, detailed topographic surveys by the U.S. Geological Survey on which to base his agency’s maps. Even so, map output by the Forest Service continued to expand as cartographic staff in the Districts and in Washington stabilized after World War I and staff in the field grew more accustomed to the routine of map revision. As Greeley wrote:

“All Ordinarily, maps are printed upon three scales—one-quarter, one-half, and one inch to the mile, depending upon the available and desired detail. All Forest Service men on field work carefully check up errors which appear upon the maps, note corrections which come to their attention, recommend to the United States Geographic Board names for unnamed topographic features, and currently gather new and more detailed data for inclusion upon the maps. After sufficient information has been secured to warrant a revision, new maps are prepared and published.”

Forest Service annual reports provide consistent numbers for the production of administrative maps, proclamation diagrams, executive order maps and, on the other hand, quite inconsistently gave quantities of an assortment of miscellaneous maps produced between 1926 and 1936. The reports did not include numbers detailing forest visitor or recreation map production. Map production numbers ceased being reported after 1936 just as aerial photography began to make a difference in the mapping program of the Forest Service.

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<p>|
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|<strong>Table 2:</strong> Administrative and special map production, 1924 to 1936 as reported in Forest Service annual reports.|</p>
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<th>Administrative Maps 1:126,720</th>
<th>Administrative Maps 1:63,360</th>
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Not only were there more administrative maps being produced, they had larger print runs and were printed in a variety of editions. Based on the requirements of the District or, after 1930, the Regional Offices, some maps were printed only in black & white, like the 1,040 copies of the 1930 1:253,440-scale administrative map of the Datil National Forest of New Mexico. A green color overlay on a black and white base map, first used in 1910 on some maps and proclamation diagrams to show Forest Service owned lands, came to be more regularly applied to maps in the 1920s. Another type of map that was introduced in the 1920s was the “gray & white” edition more useful as base maps than were the bold black & white editions. For instance, the 1932 order by the Northern Region for 823, 1:126,720-scale maps for the Western portion of the Jefferson Division, Lewis & Clark National Forest in Montana called for 290 maps with green overlay on black & white base, 263 black & white maps, and 270 copies in gray and white. With the passage in 1922 of the law to consolidate national forest lands, more administrative maps and Forest Atlas sheets were printed with a color overlay showing private or “alienated” lands within the boundaries of the national forests on a black & white base. Alienated lands were typically shown with the color pink. In addition, administrative maps also later identified specific exchange areas within the national forests in response to congressional action that permitted land exchanges for private forest lands outside national forest boundaries. An example of this type of law was “An Act for the exchange of lands adjacent to the national forests of Montana” of January 30, 1929 (Public Law 70-694 – 45 Stat. 1145). For fire control, administrative maps of the 1930s were sometimes printed with a red compass rose, useful in locating fires from forest lookouts. Compass roses were quite common on the maps of the forests in the Intermountain and California Regions. Most 1:63,360-scale administrative maps included contour lines and were issued for ranger districts or other smaller portions of the national forest. Finally, Forest Service maps were being printed on a wider variety of papers, from tracing paper to card stock to clay coated papers. In the course of compiling the carto-bibliography, two black & white administrative maps were discovered printed on cotton cloth as well as on paper. More of these noteworthy, perhaps experimental cloth maps may exist, but the two found were the 1:253,440-scale map of the 1927 St. Joe National Forest in Idaho and a 1928 Deschutes National Forest in Oregon.

In 1936, the Chief of the Forest Service’s Division of Engineering, T.W. Norcross issued a 31-page booklet entitled, *Forest Service Map Standards*. These standards represented a giant leap forward over the 1912 *Instructions for Making Forest Service Surveys and Maps* with its 10-page supplement *Signs, Symbols, and Colors*. Without text or even page numbers the 1936 *Map Standards* booklet presented a greatly expanded array of signs and symbols for cultural and physical features, boundaries, standard lettering, a fire legend, a standard map title, and legend boxes for administrative maps. Also included for
the first time were signs and symbols for the production of special maps covering range management, recreation, forest management, forest roads, proclamation diagrams and maps, federal land ownership, and for the first time, an “Air Navigation Map Legend” to be used on administrative maps. Most administrative maps issued after the release of the 1936 standards incorporated the conventional signs and symbols as well as the lettering and framing conventions found in the Standards booklet. The result was a more up to date and elegant appearing map. Even maps issued before 1936 exhibited the newly enlarged repertoire of signs and symbols, as well as the newly formatted text blocks. Many of these had been used before they were all brought together in the 1936 Map Standards booklet.

The North Pacific Region pioneered the publication of maps of individual ranger districts in the 1930s. A ranger district map was made by extracting a portion of the latest edition of an administrative map, either the ½-inch (1:126,720) or the ¼-inch (1:253,440) maps as a base and reprinting that portion to cover a ranger district. Only a few national forests of Oregon and Washington lacked full sets of ranger district maps and a few forests, like the Columbia, Mt. Hood, Siuslaw, Snoqualmie, and Wenatchee, had two different editions of maps published before the start of World War II. These ranger district maps were most often issued in black & white, however the Malheur National Forest issued a set of ranger district maps with forest visitor information printed in a red overlay. All were issued on small sheets measuring 8 ½ by 11 inches. The Northern Region constructed ranger district maps for its Coeur d’Alene (1940) and Deerlodge (1939) National Forests, but it was the North Pacific Region that produced the most pre-war ranger district mapping. It is important to note the beginnings of ranger district maps as their production quickly spread to other regions after the war to become important parts of the cartographic program of the Forest Service.

While the U.S. Geological Survey continued to be the agency that printed the most Forest Service maps during this period, government printing capacity released after the end of World War I through demobilization allowed more maps to be printed by the presses of the U.S. Army Corps of Engineers. The first maps printed by the Corps of Engineers between the years 1920 and 1934, were noted as being printed by the “Engineer Reproduction Plant, U.S. Army, Washington Barracks, DC.” The plant was located on the grounds of what is now known as Ft. Belvoir in Virginia. Maps being printed from 1935 to 1939 carried the notation, “Engineer Reproduction Plant, U.S. Army, Fort Humphreys, DC, and from 1939 to 1942 as the “Engineer Reproduction Plant, The Army War College, Washington, DC.” The Government Printing Office and a variety of its contractors printed forest visitor maps for the public. Besides the GPO itself, these contractors included The Columbia Planograph Co., The Norris Peters Co., Lithographers, Williams-Webb Co., and Williams & Heintz Co., of Washington, DC and the lithographer, A. Hoen & Co., of Baltimore, Maryland. The latter two printers were also contracted by the Forest Service to print administrative maps as well. Foreshadowing a move of the Regional Offices to arrange their own printing, quite common after World War II, the Southwestern Region contracted with the Smith-Brooks Press of Denver to print six administrative maps for the Region all dated 1941. After the war, the Forest Service increasingly turned to local commercial printers for map printing.

A. Topographic Mapping

If there was one theme running through Greeley’s reports on Forest Service mapping in the 1920s, it was the need for accurate topographic surveys of the national forests. Adding topography from U.S. Geological Survey quadrangle maps to Forest Service maps made for a more useful and versatile spatial tool, especially when geodetic control points came as standard feature of the Geological Survey quadrangle map. As Forester Greeley wrote:
“The foundation essentials for accurate maps are precise, detailed topographic surveys. These surveys are executed by the United States Geological Survey after the Coast and Geodetic Survey has extended the necessary judiciary control. Small fragmentary sections of the forests have from time to time been mapped by the Forest Service in connection with timber sales or other activities which require immediate data. The service cooperates with and assists the Geological Survey in every possible way, including financial aid whenever available, in surveying and mapping the national forests.”\(^{43}\)

Despite the surveys conducted by the Forest Service, the basic need remained for accurate topographic maps produced by the Geological Survey. In 1924 the Congress considered increasing topographic map production with the Temple Act or “An Act to provide for the completion of the topographical survey of the United States.” The law called for the completion of topographic mapping of the United States in twenty years with adequate horizontal and vertical control and the publication of the resulting maps by the federal agencies that then existed. It also allowed the federal mapping agencies to enter into cooperative agreements with the states or municipalities to complete topographic mapping within their borders. The Temple Act passed and was signed into law on February 27, 1925 with the support of the Forest Service, the Geological Survey, and other agencies. However, it was never funded. Greeley noted:

> "After passage of the Temple Act (Public Law 68-498 – 43 Stat. 1011) in February [27], 1925, it was hoped that considerable progress would be made in mapping the national forests. The bill authorized but did not appropriate funds. Subsequent appropriations by Congress have been insufficient to permit of any new mapping of Federal projects other than those on which State cooperation is obtainable. This has excluded all new national forest projects. It is estimated that 46 per cent of the area of the national forests has been topographically surveyed to a standard which is at present satisfactory. The remaining 54 per cent, or approximately 99,000,000 acres, is in need of accurate topographic surveys. Topographic maps of the forest constitute an essential administrative tool in connection with plan-wise development and satisfactory utilization of resources, and efficient protection, and some way for making more rapid progress in obtaining these maps is an urgent need."\(^{44}\)

The Forest Service continued to make its own topographic surveys covering individual projects, such as timber sales, land exchange, road projects, and river basin mapping. The agency also continued to gather new topographic mapping as produced by other federal or state agencies. For instance, in the same annual report for 1926, Greeley noted that a cooperative agreement between the state of Montana and the General Land Office was initiated to produce a standard topographic survey of each township whenever the GLO made a new or revised township plat. The state and the GLO shared this new mapping with the Forest Service.

### B. The Beginnings of the Forest Service Aerial Photography Program

Disappointed by the failure of Congress to appropriate funds to fulfill the promise of the Temple Act yet remaining steadfast in support, Greeley in his annual report for the 1927 fiscal year, his last, cited another cooperative means to obtain accurate data for forest mapping:

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“The photographic survey made by the Navy Department by airplane embraced practically all of southeastern Alaska except Baranof and Chichagof Islands. The photographs were taken at an altitude of approximately 10,000 feet, and are on a horizontal scale of approximately 1,660 feet to the inch [about 1:20,000-scale]. Arrangements have been made with the Navy Department and the Geological Survey whereby prints of these photographs may be purchased by the public. The map that is being compiled by the Alaskan branch of the Geological Survey from these photographs will be on a horizontal scale of 1:180,000, or approximately 15,000 feet to the inch.

“In connection with the aerial fire patrol in Idaho, an aerial photographic survey covering about 64 square miles in the Kaniksu National Forest was conducted for experimental purposes. A K-3 single-lens camera was borrowed from the Army Air Corps. The area was photographed from an altitude of approximately 10,000 feet. A serviceable mosaic map on the scale of 6 inches to the mile was made from the photographs.”

The data collected by the pioneering aerial photography project of the Navy was later used by the Alaska Region of the Forest Service as baseline data to produce a set of blueline photomaps of the Tongass National Forest between 1934 and 1938. The smaller photographic survey of the Kaniksu in Idaho was extended to the Nezperce National Forest in 1929. Forester, Robert Y. Stuart, did not lament the lack of U.S. Geological Survey topographic mapping of the national forests in his annual reports as his predecessor Greeley had done. Rather, he seemed energized in his first report in 1928 to write that “An aerial survey of a portion of the Nezperce National Forest in Idaho was started, but inclement weather and condemnation of the airplane used for the work shortly after it was initiated forced its abandonment. The results secured, however, gave evidence that this method of mapping forest areas has decided promise.”

Aerial mapping had its beginnings in World War I when topographers serving with the U.S. Expeditionary Forces in France made use of airplane photographs in correcting old maps and making new ones along the changing battle fronts. In 1919, the Schoolcraft, Michigan area was photographed using a K-1 single-lens camera by the Army Air Corps and by using a variety of improvised methods, U.S. Geological Survey topographers were able to reduce the photographs to a uniform scale of 1:48,000, map all two dimensional or planimetric features, and finally add topographic contours to the 15-minute quadrangle. The Schoolcraft Quadrangle became the first USGS topographic map to be produced from aerial photographs. The methods used were still experimental, but aerial photography held out the promise of becoming a faster more efficient method of obtaining field data for mapping and other resource management purposes.

By 1931, the Forester announced in the annual report that: “Two contracts were awarded to airplane companies to obtain mapping data required for the preparation of Forest Service maps. This method of obtaining survey data should prove economical for large-scale maps.” Not only did the Forest Service rapidly adopt the use of aerial photography in the 1930s, but so did most every mapping and resource agency of the federal government. In its need for highly accurate and large-scale mapping, the Tennessee Valley Authority, created in May of 1933, turned to the U.S. Geological Survey for assistance. Time limitations and the extensive area involved gave the Survey an opportunity for an all out test of aerial photography in this monumental mapping project. Technological advancements in stereo and multiplex mapping equipment led to a complete revolution in mapmaking procedures for the Survey and for other federal map making agencies. It was no coincidence that the American Society of Photogrammetry was

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incorporated in Washington, D.C. in 1934, with leadership drawn from the ranks of the federal civil service, notably, from the Geological Survey’s Topographic Branch.

Because of its remarkable versatility, the Forest Service quickly embraced aerial photography. Aerial photography was not solely used for mapping purposes. In 1936, Chief Silcox noted:

“In compiling the maps the available data of other government agencies are used. Where adequate data are not available and cannot be supplied within a reasonable time by the regular mapping agencies of the government, the necessary surveys are made by the Forest Service. Aerial photographs are being used extensively. They are valuable also for determining fuel and forest type in fire-control studies, for range investigations, and for studying slopes in erosion control; and they are used by lookouts, rangers, and others to aid in locating reported fires and to determine the cover type and topographic conditions where a fire is reported. All flying has been done under contract with private concerns. In some cases the cameras and photographers belong to the Forest Service.”

The total number of square miles contracted by the Forest Service to be flown each year rose and fell during this period from the mid-1930s to 1941, but maintained a steady pace. By July 1, 1941, the Forest Service had obtained aerial photography coverage for over 114,421 square miles or 73,229,440 acres, equal to 41% of all national forest land. However, compilation narratives on Forest Service maps do not give credit to photogrammetric methods, either for new or revised maps, but there are a few exceptions. The photomaps produced by the Alaska Region have already been mentioned. The Rocky Mountain Region produced a series of 21 large format planimetric quadrangles with hachures at 1:63,360-scale for four of its national forests, namely the Medicine Bow (1937), Routt (1938), San Isabel (1940), and Uncompahgre (1939), using aerial photographs. These were unpublished in preliminary blackline prints. A special feature of these maps was that the verso of each quadrangle carried numbered photo centers for the aerial photographs used in their compilation, creating a ready-made index to the aerial photography. The numbers were printed backwards in blue, so when the map was placed face up on a light table, the photo center number was readable through the map. In November of 1941, the Surveys and Maps Branch of Region 2 “constructed” a pair of controlled photo mosaics of the Bessey and the Niobrara Divisions of the Nebraska National Forest. The photomaps show the national forest boundaries, public land grid, roads, trails, railroads, Forest Service administrative facilities and other structures, windmills, camps, ranches, walls, and lookout stations. These two examples of mapping from aerial photographs from the Rocky Mountain Region clearly show how far and how fast the Forest Service had adopted aerial photography.

Laboratories and other facilities as well as technology for processing the huge quantities of photography kept pace with the increased reliance upon aerial photography. The Forest Service was clearly on the cutting edge of adapting aerial photography to their mission. Chief Silcox proudly stated in his 1936 annual report:

“The Forest Service has one of the best equipped photographic laboratories in Washington, and has photostat, blueprint, and multilith equipment in most of the regional offices. In addition to Forest Service work, most of the photographic work for the Resettlement Administration has been done in Washington and some of the regional offices. The photographic work accomplished during the year comprised 995,904 square

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49 Square miles of aerial photography flown for 7 years between 1936 and 1941 in Forest Service’s annual reports.
feet of blueprints, 558,197 square feet of blue-line prints, and 600,284 square feet of black-line prints; 173,213 square feet of Van Dykes; 30,596 square feet of solar bromide prints; 434,466 square feet of photostats; 100,013 square feet of map mounting; and 153,096 prints of photo views.”

And that:

“At Forest Service photographic laboratories in Washington, in addition to the regular work, photographic requisitions are filled for 12 other government bureaus.”

Technological advances made by the federal government, especially involving stereo photographic plotting machines and multiplex projectors, made mapping of land features independent of elevation (planimetric elements) and topographic mapping faster and more accurate. The American Society of Photogrammetry developed standard specifications for aerial photography, which were adopted as standard government specifications by the U.S. Treasury Department’s Procurement Division. These standards made aerial photography contracting easier and more efficient. The Society also issued precision mapping camera specifications and map accuracy standards that were also adopted by the profession. The stage had been set for photogrammetry to assume an even larger presence in mapping and resource management. The Forest Service had positioned itself well with facilities, equipment, and trained staff to take advantage of these advances during and after the war.

C. Maps for the Forest Visitor

Maps made by the Forest Service for the forest visitor was an important part of the recreation policy of the agency. The maps were both practical, showing roads, trails, campgrounds, and other visitor facilities, as well as instructional, communicating the policies, priorities, and the conservation philosophy of the Forest Service. The Forest Service produced a variety of maps for the visitor, the most common being the folded recreation map of an individual forest using the standard 1:253,440-scale “¼ inch” base map. A surge in the production of visitor maps began in 1925. All Districts of the Forest Service saw an increase in this type of map. The reason for the increase is not difficult to find. Forester William B. Greeley wrote in his annual report for the fiscal year ending June 30, 1924 that “The number of people visiting the national forests for recreation is estimated each year by the local forest officers…The Total number of visitors reported last year exceeded 10,500,000. In less than ten years the number has more than tripled.” The increase in recreation use was due to the greater accessibility to the national forests made possible by more and better roads and expanding automobile ownership. Greeley continued by writing that the estimate of the number of people visiting the national forests can only be an approximate one, but that “The main point is that recreational use of the forests has assumed staggering proportions, and is rapidly increasing. A corresponding administrative responsibility is involved.” An appropriate and corresponding result of increased use of the national forests by the public was to issue more information about the national forests along with the rules and regulations to insure their proper use. What better vehicle than the folded forest map with descriptive text, rules, and illustrations on the back. In the same annual report, under the heading “Maps and Surveys” Greeley wrote, “Forty-five maps of national forests, on various scales were complied and printed. Though made primarily for administrative use these maps are of considerable value to the public, with a resulting demand for them often greater than can be met. Authority to sell maps and use the receipts to meet the cost of printing larger supplies

52 Ibid.
would be advantageous.”

Lacking a forest visitor map, administrative maps were often given away despite modest print runs.

The First National Conference on Outdoor Recreation held in Washington, D.C. from May 22nd to May 24th, 1924 did not specifically recommend an increase in recreation map publishing, but it did draw the public’s attention to the need for more tourist facilities, public education, and coordination among various government agencies in the use of the public domain. Table 3 details the jump in forest visitor map production beginning in 1924, which was sustained, right into the early years of the Depression era when numbers began to fall.

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*Table 3:* Number of visitor maps published for entire forests, states, or regions in a folded format by region and by year of publication. Excludes ephemeral and recreation guide maps. Region 2 included the national forests of Minnesota, Michigan, and Wisconsin until 1929. Region 7 included the southern states (Region 8) until 1934.

Forest Service staff most often enhanced the “4 - inch” administrative maps with black and white or color overprinting detailing roads, campgrounds, picnic areas, and other attractions. Once again, the decentralized administrative structure insured variations based on local conditions. Not every forest visitor map from this period was based on the 1:253,440- base map. For instance, the Southwestern District opted for a sketch map of the forest highlighting recreation information alongside a smaller-scale vicinity map of a larger area showing the forest in a context of highways, railroads, and cities. The Sitgreaves National Forest, a small forest relative to the others in the Southwestern District, issued a forest visitor map in 1930 at 1:253,440-scale, but due to large average size and dispersed nature of the national forests in Arizona and New Mexico, smaller scale maps were initially chosen by cartographers in Albuquerque. Each Region also had its own array of special maps issued together with its maps of the national forests. Region 6 produced a series of state highway maps for Oregon and for Washington as did Region 5 for California. There were also maps issued for the various national monuments.

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administered by the Forest Service at that time, such as Oregon Caves, Bryce Canyon, and Chiricahua. The Government Printing Office printed the majority of these folded national forest and special maps and as such, the maps were automatically included in the depository library program run by the GPO affording the maps wide distribution.

The ever changing boundaries and names of the national forests challenged Forest Service staff facing the question of what to do with their stock of forest visitor maps after the national forest had changed its name or had been merged with another. During this period quite a few national forest visitors maps bore hand stamped corrections or pasted overlays on map titles to account for name or boundary changes, as when the Colorado National Forest became the Roosevelt or the Crater National Forest became the Rogue River. The supply of forest visitor maps of the Lewis and Clark National Forest issued in 1930 was corrected in 1932 by a glued typescript half sheet over page two in the text stating that the map only covered a portion of the Lewis and Clark after the Jefferson National Forest had been added to it. The 1930 map only showed the Rocky Mountain portion of the merged forests. After such changes, administrative maps were often quickly revised and reissued. But supplies of recreation maps first had to be exhausted before new editions were prepared, thus the necessity of these improvised measures at updating. The geography of the national forests was, even during the interwar period, still very much a work in progress.

D. Recreation Maps and Map Booklets

The coming of the New Deal brought more variations on the agency’s forest visitor map program as the Forest Service and other bureaus of the federal government sought to promote domestic travel and tourism. To that end, several regions of the Forest Service issued a variety of recreational maps not just the standard 1:253,440-scale folded visitor maps. The Forest Service hired workers enrolled in the Roosevelt administration’s Work Progress Administration and other federal employment programs and had them quickly turn out text, artwork, and utilitarian mapping for smaller Forest Service administrative units, such as primitive, scenic, and popular recreation areas. These were much less finished in appearance than the standard national forest visitor map. These visitor maps came printed on a lighter weight paper and were easily revised and often reprinted. However, not all regions issued an ephemeral recreation map series. The most extensive was the “Recreation Guide Series” published by Region 6 out of its Portland, Oregon headquarters. The North Pacific Region issued two sets of guides: a series of 29 folders for recreation areas of Washington State and another series of 41 folders for those areas in Oregon (see below Illustration 9). Because of their temporary nature, not all proposed numbers were issued so these total numbers are speculative based on actual maps found. The Southern Region and the North Central Regional also published their own recreation map series often simply because fully edited ¼-inch national forest maps had not yet been issued by the Regional Office. But here the visitor maps covered an entire national forests not smaller areas of recreational interest. The ambitious and rapid pace of the purchase program under the Weeks Law of 1911and its amendments in Regions Eight and Nine presented cartographers with ever changing boundaries. Any map issued for the national forests in these regions almost instantly became out of date. Therefore, forest visitor maps of the national forests in these regions during the 1930s were best quickly made, revised, and reissued. The California Region did not have a stand-alone recreation map series but many of the maps issued for the public covering one entire national forest during the 1930s were entitled “Recreation Map…” and carried a sketchier smaller scale map within a much larger text section. The Northern Region issued only a few recreation maps and these carried lively drawings of game animals and natural features. The Southwestern Region produced several travel publications for the forest visitor to the region’s national forests, especially the Carson and Santa Fe. These mimeographed publications contained road logs, a sketch map, and some text addressing the history of the area traversed by the tours. These tours were later combined with other
tours for all forests in the Southwestern Region, and printed together in the 1940 publication, “Short Trips to – National Forests in the Land of Coronado.” This publication was issued on the occasion of the 400th anniversary of the entrada of Francisco Vázquez de Coronado into what became the southwestern United States in 1540-1542.54

The less polished recreation maps of the 1930s stand in contrast to another form for forest visitor publication, the booklet style publication (see below Illustration 10). These booklets grew out of the Forest Service booklets of the 1910s and 1920s that were usually issued in one or more of the U.S. Department of Agriculture publication series, such as the USDA Departmental Circulars or Forest Service Bulletins, which were chiefly text publications that frequently included a map. The booklets issued by the Rocky Mountain District and then discontinued in favor of the ¼-inch scale folded forest visitor maps can also be seen as part of the booklet style tradition that was carried into the 1930s (see above Illustration 8). The first of this period’s national forest booklets came from the Eastern Region in 1932. Entitled, Eastern and Southern National Forests: Timber Farms – Outdoor Playgrounds – Watershed Protection, the booklet had 18 pages of descriptive text and black & white illustrations with a map inside the back cover. The Government Printing Office printed every one of the forest visitor booklets and as a consequence, all were widely distributed to the nation’s depository libraries.

Due to size restrictions, the map found folded in the back of the booklets all have a smaller scale and appear less finished and complete in contrast to the ¼-inch folded forest visitor maps. By editing out information not useful to the tourist and highlighting the features and forest improvements on the map that were important, these maps were a practical and effective geographic tool for the auto camper or tourist, but not for avid hikers to the back country. Over the years, the maps often became separated from the booklet. This makes them less useful without the supporting text. This style of booklet ceased publication in 1943 with the publication of the Cache National Forest booklet, but was resurrected after the war, especially by the Intermountain Region, the last one being issued by that region in 1952 for the Wasatch National Forest. In 1948 the Intermountain Region published a 17-page information booklet for the Caribou National Forest without the customary map tipped in behind the back cover. In the same year a separate folded forest visitor map resembling those found in the typical map booklet with a blank reverse side, was issued for the Caribou. The geographically extensive Caribou National Forest yielded a very large map that did not easily fit and could not be supported behind the paper back cover of the booklet. Thus both were published separately. Booklet style publications were printed and distributed by all Forest Service regions except for the Northern, California, and North Pacific Regions. The Southern and North Central Regions issued a single booklet for all national forests in the states of Florida and Michigan respectively. The Caribbean National Forest in Puerto Rico published a booklet in 1936 and again in 1940, the only forest visitor publications or maps issued for this unique tropical national forest.55 There would have been more of the booklet style publications for individual national forests had not World War II intervened.

E. Two Noteworthy Forest Service Illustrators

Two illustrator-cartographers hired by the Forest Service in 1937 deserve particular mention: Harry L. Rossoll and Thomas Speiden Culverwell. Henry Rossoll (b.1910) began his career as an illustrator in the Forest Service's Southern Regional office in Atlanta, adding drawings to the Region’s Recreation Guide series. An example of his pre-war work for the Ocala National Forest recreation map is found below (see

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54 These special regional recreation series of maps and publications are examined in detail in each regional chapter of this work.
55 In 1905, the Bureau of Forestry under Gifford Pinchot published its Bulletin 54, a 52-page description of the Luquillo Forest Reserve, the predecessor to the Caribbean National Forest, with a map folded inside the back cover.
Illustration 11). Like many Forest Service employees, Rossoll joined the armed forces at the outbreak of World War II, serving in the Navy until 1944, when he rejoined the Forest Service in Atlanta. He is most famous for his more than 1000 "Smokey Says" newspaper cartoons which helped make Smokey Bear an almost universally recognized symbol of forest fire prevention and one of the most successful public relations campaigns ever conducted by a federal agency. While he is most remembered for his Smokey Bear illustrations, his artwork can be found on many of the panel illustrations decorating the covers of forest visitor maps of national forests of the Southern Region. His one map credit was a pictorial map he drew of the Ouachita National Forest, Arkansas, in 1940. In 1967, Rossoll drew a remarkable pictorial guide map of the Kiamichi Mountain area, including the Kiamichi Division of the Ouachita National Forest for the Talihina Lions Club of Oklahoma. After retiring from his position as “Visual Information Specialist” with the Forest Service in 1971, he was asked to paint 14, 7 x 25 foot dioramas for the Forest Heritage Center Museum in Beavers Bend State Park near Broken Bow, Oklahoma. The murals, which required 12 years to complete, illustrate such subjects as prehistoric forests, the local Caddo Indians, papermaking in the South, 1940's lumbering, and forest appreciation. Harry Rossoll died in 1999 at his home in Atlanta.

The Eastern Region also hired an illustrator-cartographer about the same as the Southern Region hired Rossoll. Thomas Speiden Culverwell (b. 1902) had put his artistic gifts to use well before joining the Forest Service by regularly supplying illustrations, comics, and political cartoons for Washington, DC newspapers, particularly the Washington Daily News. Culverwell created and brought to life such memorable characters as Senator Fuller Bunk and a young mischievous lad, Tim Tinker, in a 1920s comic strip. A 1937 entry in the Washington city directory recorded his occupation as that of a draftsman working for the Forest Service for the first time. Culverwell was responsible for several remarkable pictorial maps of the national forests of the Eastern Region. His pictorial maps of the Allegheny, George Washington56 (see below Illustration 12), Green Mountain, Monongahela, and White Mountain National Forests reached such a high stage of refinement and artistic accomplishment for the genre not seen before or since in Forest Service recreation maps. All were drawn before World War II, but a few remained in print long afterward. The last printing of one of his pictorial maps was of the White Mountain National Forest map published in 1962. During the Second World War, Culverwell served with the Office of Strategic Services, the predecessor of the Central Intelligence Agency, in China and India. While stationed in Washington, DC, he prepared topographic models and military maps. He returned to the Forest Service after the war as an illustrator and created many posters promoting on the job safety. He also drew safety-themed illustrations for Forest Service calendars in the 1950s. He retired to the coast of Maine in 1956 where he drew maps for the Potomac Appalachian Trail Club, of which he was a long-time member. Culverwell will be best remembered for his 1969 visitor map of Mount Desert Island, which was distributed for many years by the Bar Harbor Chamber of Commerce. He died in his home at Southwest Harbor on Mount Desert Island in 1977.

56 The George Washington National Forest was part of the Eastern Region at the time Culverwell drew his pictorial map.
Illustration 9: Detail and title block for Recreation Guide No. 14 – Washington, Skykomish Recreation Area, 1936 published by the North Pacific Region (Region 6). It was compiled by “F.G.” in the Seattle Headquarters of the Snoqualmie National Forest. Relief and principal tourist and Forest Service infrastructure is shown pictorially.
Illustration 10: An example of the booklet style publication with a map tipped in behind the back cover produced for the forest visitor. This 1939 example for the Coconino National Forest carries a photograph of the San Francisco Peaks north of Flagstaff, Arizona on its front cover.
Illustration 11: Artwork from the early career of illustrator Harry Rossoll, who made Smoky Bear famous with his “Smoky Says” cartoons. These illustrations are from the title and back cover of the 1937 Recreation Guide to the Ocala National Forest drawn by Rossoll. After serving in World War II, Rossoll rejoined the Forest Service in Atlanta in 1944, where he went on to supply cover art to many of the forest visitor maps and booklets issued for national forests of the Southern Region. His signature appears below the canoe on the left and the deer on the right.

With the Japanese attack on Pearl Harbor, Hawaii, on December 7, 1941, all duties and responsibilities assigned to the Forest Service for managing the national forests were transformed into essential parts of the nation’s overall war and defense efforts. Fire-prevention activities protected vital wood resources needed for wartime and served an important role in civil defense. The forest-fire lookout network became a major feature of the Army’s air-raid detection system. Research activities turned to efficient ways to box and crate supplies and equipment destined for the armed forces and our allies overseas, while alternative sources of rubber (the guayule plant) were explored on California’s Cleveland National Forest. Human resources of the Forest Service were also mobilized for the war. The Chief of the Forest Service, Lyle F. Watts stated in his annual report for 1945 that, during the war period, 1,825 men and women in the Forest Service left their regular jobs to serve in the military forces, at a significant sacrifice to the agency. About 500,000 acres of national forest land in nine states and territories had been transferred to the War and Navy Departments or made available through cooperative agreements for military reservations, artillery ranges, maneuver areas, or proving grounds. Forest Service engineering staff and facilities were enlisted almost immediately for war work. As Acting Chief, Earle H. Clapp wrote in 1942, “The engineering facilities of the Forest Service were called upon by the Army Corps of Engineers for aerial photography, photogrammetry, and topographic-mapping work covering more than 4,000 square miles in California.” The next year, Chief Watts reported:

“Practically all regular surveying and mapping were suspended to expedite delivery to the War Department of large-scale, precise, topographic maps of two tracts in California, aggregating 4,345 square miles. Additional work of this kind in the East is now being undertaken for the War Department. A large amount of aeronautical-approach mapping and of photograph and map-enlargement work has been done for the Air Service.

“Accumulated demands for aerial photography and accurate maps needed for the protection, development, and administration of the national forests, and the extraordinary maintenance and betterment that will be required to bring forest roads and trails up to a satisfactory standard, will call for resumption of regular work on a much larger scale as soon as the situation permits.”

The Engineering Department of the Forest Service continued to concentrate on work assignments related to the war in 1944 and throughout 1945. Engineering work done in the past by the Forest Service documenting the construction of bridges, fire towers, signs, water development, and other Forest Service structures for the national forests was put into technical handbooks for the use of the armed forces. War work also occupied most of the time of Forest Service cartographers, as in 1944:

“The war-mapping project was terminated upon completion of precision topographic maps from aerial photographs for 2,750 square miles in Pennsylvania,

57 James B. Yule, an engineer and cartographer from the Northern Region was detailed to California during World War II as a map maker for the U.S. Army and was later charged with finding suitable factory space to process guayule, a milkweed plant from Mexico, into rubber.
Maryland, and Virginia. This job required more than 100 skilled surveyors and mappers. Twenty-one stereoscopic plotting machines, invented in the Forest Service, were used in turning out more than 100 quadrangles. Other confidential work on theater-of-war maps has been completed and additional work is being undertaken.

Specialists of the Forest Service photographic laboratory have devoted over 20,000 man-hours to aeronautical approach charts, foreign and domestic war mapping, and photostat and enlargement work for the Office of Scientific Research and Development.61

And in 1945:

“Last year, the War Department terminated the topographic mapping on which the Forest Service had been engaged. However, the Navy Department requested similar assistance and, when the war with Japan was speeded up, a large increase in personnel was required.

The job involved making maps of war areas with as much accuracy as possible from whatever information was available. Sometimes, there were no maps at all; in other instances recent aerial photographs permitted changes on existing maps. Ordinarily, the source material would not be sufficiently accurate or adequate for good mapping. Great ingenuity was called for in finding practicable and satisfactory ways of using available data. The morale of the organization was high; each man realized the importance of the work in the Pacific War.62

Through these efforts Forest Service cartographers made their own unique and essential contributions to the war effort, however, they came at a cost to the agency. At the end of the war the general condition of the mapping of the national forests was dismal. Most maps were old and outdated. There existed a very large cartographic deficit with which the agency had to contend.

10. A New Generation of Mapping, 1946-1975

It took over a year before the Forest Service could complete the transition from war to peace-time conditions. Nearly one thousand Forest Service personnel who had served in the armed forces had returned for work by June 30, 1946. Only 27 former Forest Service staff did not take advantage of their reemployment rights.63 These returning veterans were all welcomed back into the workforce, but the process of reintegrating veterans was made more difficult due to the fact that many Forest Service employees who had been transferred to various temporary wartime agencies, activities, and projects also needed to shift back to their peacetime roles within the agency. Even in the midst of the transition, the Forest Service furnished the War Department with five technical employees to assist in organizing the

63 The issues of the Directory, Forest Service, for 1943, 1944, 1945, and 1946 carry an “Honor Role, Forest Service Personnel in the Armed Forces” in the back pages. The listing is arranged by Forest Service Region, beginning with the Washington Office followed by Experiment Stations and other research facilities and indicates the name, branch of service, and if the staff member had been killed in the line of duty.
forestry program for the occupation of Japan and Korea. A forester was also made available to administer civilian forestry projects in the American zone in occupied Germany.

As for the situation of the Forest Service’s post-war mapping effort, Chief Watts wrote:

“During the war the Forest Service’s Engineering Division was engaged in special war-mapping projects for the Army and Navy. After VJ-day, the Navy Department requested continuation of Forest Service assistance in the preparation of maps by photogrammetric methods. Most of this work has now been completed, and the Division is shifting from war activities to preparation of maps needed for regular Forest Service work. Maps adequate in scale, accuracy, and detail are available for only about 15 percent of the national forests. Most maps in use are obsolete. Contracts were awarded in 1946 for aerial photography of approximately 34,000 square miles. New methods and equipment, such as a camera transit, photo transit, and radial-line plotter have been developed to obtain greater accuracy and increased production in mapping work.  

A new generation of Forest Service administrative maps arrived shortly after the war’s end. The California Region issued the first such example with its 1947 administrative map for the Tahoe National Forest. By the end of the 1970s all national forests, except for those in the Intermountain and Alaska regions had their own comparable versions of a highly accurate “Class A” administrative map. Most were compiled and published in the 1960s and many saw two or even three editions. The 1947 Tahoe map launched the “Forest Series” administrative map type with a scale of 1:126,720, or a new 2-inch map. As stated on the map itself, the 1947 Tahoe map was constructed in the San Francisco Regional Office “from Forest Service planimetric maps constructed by photogrammetric methods from aerial photographs,” with vertical and horizontal control points established by the Forest Service, U.S. Coast and Geodetic Survey and the U.S. Geological Survey. As a transition map, the 1947 map does not appear very different from the 1:126,720-scale administrative maps that were produced by the California Region in the previous decade or from the older maps then being revised and reprinted.

All Forest Service maps were still governed by the 1936 mapping standards, which determined the format, symbols, and overall appearance of Forest Service administrative maps. The difference is found in the 1947 map’s accuracy, based as it was on primary source data and not compiled from existing maps. The 1947 Tahoe map and the new administrative maps that followed were produced from Forest Service planimetric maps which were constructed directly from aerial photographs or from U.S. Geological Survey quadrangles that had been made from aerial photographs. Maps in the “Forest Series” became the Forest Service’s flagship map series and after 1951 when the map classification ratings were first applied, they were given the highest map accuracy designation of “Class A.” Until the advent of aerial photography, the Forest Service had used cartographic data from other agencies of the federal government with field checking by their own staff, to produce their maps. Aerial photography offered a steady source of accurate and reliable base material. With the equipment, technology, and staff on hand to translate the photography into maps, the Forest Service was for the first time able to make its own maps in greater quantity and with greater accuracy than in the past.

65 By 1975 the Intermountain Region had issued 1:126,720-scale administrative maps for all its forests with a map accuracy of “Class C” which reflects this region’s dependency on very high altitude aerial photographs flown by the U.S. Army. Alaska issued only one Class A map up to 1975. This was a 1963 Sitka Ranger District map at 1:253,440-scale.
There was, however, an immediate need for maps after the war by resource managers and foresters as well as the public, and while the advent of the new Forest Series maps was a milestone event, constructing the new generation of administrative maps was projected to take years, especially in light of small budgets for aerial photography acquisition. Chief Lyle F. Watts wrote in his 1950 report that, “Mapping funds available to the Forest Service continue to fall short of financing the standard maps needed for management of the forests. In the meantime, planning sheets prepared in developing standard maps have to suffice as forest administrative maps.” In other words, advance or preliminary maps were used in-house as an alternative for final accurate mapping. To make up for the lack of funding, the Forest Service cooperated as often as it could with other federal agencies in the acquisition of aerial photographs, as in 1949 when through the cooperation of the Navy, 25,000 square miles of aerial photography was obtained for national forest areas in Alaska.

Even though there was an overwhelming need for maps, Forest Service cartographers were justifiably reluctant to put much effort into updating older maps whose base data was unreliable or unknown. This led regional office staff to quickly make limited revisions or simply reprint many older maps. Some administrative maps were revised and issued only in blue line editions so they could be reproduced on demand until newer maps could be printed, conserving their region’s resources. The resulting mix of older map stock, slightly revised, and new mapping from aerial photographs then in use prompted the Division of Engineering to introduce a map classification system, whereby a map designated “Class A” was the most accurate, being compiled from recent aerial photography by photogrammetric methods, all the way down to “Class EE” for maps of unknown accuracy. In the Northern Region, the reprinting of the 1936 Cabinet National Forest topographic map in 1956 under a new title Parts of the Kaniksu, Kootenai and Lolo National Forests (former Cabinet National Forest), Montana is an example of such reprints out of necessity. The new title illustrates how the lands of the former Cabinet National Forest were divided among existing national forests. This reprint was given an accuracy rating of Class EE. When there was a mix of cartographic base data, an authority diagram was often added in the margin of the map to indicate the accuracy at any given point on the map. For instance, the administrative 1:126,720-scale maps of the 1953 Deerlodge and 1954 St. Joe National Forest carry such diagrams. One class of data might predominate, yet because of the mixed data, no overall map class designation could be assigned to these maps. When one such map class designation could be applied to the entire map, the maps were given that class. These began to appear on Forest Service maps beginning in 1951 and the practice endured well into the 1980s. By then, most every map produced by the Forest Service was a Class A map.

Topographic mapping prepared by the Forest Service was limited to national forest areas that were unlikely to be mapped by the United States Geological Survey in time to meet urgent forest management requirements. For instance, aerial photography was acquired for the Prescott National Forest in 1946. By using stereo-photogrammetric methods with the KEK plotter and with field checking, 15 topographic maps were prepared by the Forest Service on the scale of 1:62,500. These standard 15-minute topographic quadrangle maps were then turned over to the U.S. Geological Survey for printing in 1948. They were included into the Geological Survey’s topographic mapping program, noted as being available on topographic map indexes, and distributed by Geological Survey. Some of the sheets made by the Forest Service and printed by the Geological Survey did not cover the entire 15 minute area, only the area

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68 An explanation of the map classification system used by the Forest Service could not be found. Assertions found here are based on the map record and annotations on maps themselves from the National Archives collection.
within the national forest boundaries. Other topographic mapping projects pursued by the Forest Service were ones based on the Public Land Survey System for the Shawnee National Forest in Illinois from 1971-1982 and a planimetric quadrangle series covering the Clark and Mark Twain National Forests in Missouri. Maps in these three series were published at a scale of 1:24,000. The Forest Service’s contribution to the national post-war topographic mapping efforts has largely gone unacknowledged.

In an example of decentralization, between 1949 and 1960 the North Central Region of the Forest Service, the predecessor to the Eastern Region in the Great Lake states, compiled a set of timber survey maps covering the national forests in Michigan, Wisconsin, and Minnesota, based on aerial photographs. Sheets in the series were entitled, [Year] Timber Survey, ... National Forest... and were “compiled at the Office of the North Central Region, Milwaukee, Wisconsin” between the years 1948 and 1959 and issued between 1949 and 1960. The color sheets, each covering one Township or 36 square miles at 1:31,680-scale show dominate vegetation/land cover types, such as scrub oak, cottonwood, non-productive swamp, etc., with notes as to tree size and density. Production of these thematic maps was a priority of the North Central Region and so much cartographic effort was placed into producing these thematic maps by the region that their production accounts for the fact that other more ordinary administrative and forest visitor maps were not issued by Region 9 during this time. Production of new editions of forest visitor maps for the region’s national forests resumed in 1958 and for Class A administrative maps in 1959.

For the public, very few new maps were issued for their use until near the end of the 1950s. Production of planimetric base maps from aerial photographs that were later used to construct Class A administrative maps had a higher priority as did “Timber Survey” maps that were based on aerial photographs. Class A administrative maps well outpaced forest visitor map production. When issued, forest visitor maps were highly variable in quality and appearance. They embraced a wide array of scales, had accuracy ratings lower than “A” or no rating at all due to the mix of data used in their compilation, and were not as detailed as the administrative maps. Some were downright sketchy. There was a very real divergence between forest visitor maps and administrative maps from 1946 to the early 1970s, whereas before World War II, the Forest Service used its standard 4-mile administrative maps as the base for most every forest visitor map. The decentralized administrative model was on full display in regards to forest visitor mapping by the various regional offices of the Forest Service after the war as administrative mapping shot ahead of mapping for the public. In the late 1960s and the following decade there began a convergence of administrative maps and maps made for the forest visitor. The decade of the 1970s saw more and more forest visitor maps being issued based on the Forest Series administrative maps at 1:126,720-scale with a Class A accuracy rating. These initial maps were not the traditional folded map with an illustrated panel title and extensive text on the verso, but were folded administrative maps with abbreviated tourist information, such as a table of recreation sites. In some cases uncolored “Travel Plans” or forest visitor maps issued to serve only for a brief time were issued, frequently on a black and white base with one color. As the decade of the 1970s progressed, better more accurate and detailed forest visitor maps based on the Class A Forest Series in the traditional folded format with panel title, text, and photographs became the Forest Service standard map for the public.

During the 1960s and early 1970s, ranger district mapping became a significant part of the mapping program of the Northern, California, and Pacific Northwest Regions and to a lesser extent to the Intermountain Region. Ranger district maps were extracted from the most current Class A 1:126,720 administrative maps then available. The ranger district was made to fit a particular paper size and thus many were issued at a smaller scale than 2 miles to the inch. The California Region added text and photographs on a select number of its ranger district maps and distributed them as forest visitor maps. A few of these ranger district/forest visitor maps were issued folded such as those for the Mendocino and Six River National Forests, and others, like a few of the ranger districts of the Shasta National Forest
which received heavy recreation use, were issued flat. For the national forests of southern California, ranger district maps were revised annually as “Fire Prevention” editions showing areas closed to the public. These fire management maps were issued for the Angeles, Cleveland, and Los Padres National Forests as well as for the forests of the Pacific Northwest Region. In Region Six, ranger district maps also were published folded as forest visitor maps as in the case of the Snoqualmie National Forest. Ranger district maps of the Northern Region were primarily used as administrative maps because of the Region’s adequate series of forest visitor maps. With the exception of the Angeles and the San Bernardino National Forests, the California Region stopped issuing folded forest visitor maps covering one single national forest from 1952 to 1966 which made the Region’s ranger district maps the only current maps available for public use. The ranger district map proved to be a useful and versatile cartographic product serving several purposes. However, because ranger district names and boundaries were easily and often changed, tracking them over time can be difficult.

The mapping of Forest Service special areas for the outdoor recreationist took off during this period. Maps of wilderness, wild, and primitive areas were made and issued by the Forest Service often for the first time, along with maps of special areas noted for their recreation opportunities, such as Priest Lake in Idaho and the Mammoth – High Sierra region in California. Trail maps of all sorts from the Cascade Crest Trail in Oregon to small day hike trails on the Hoosier National Forest were mapped and issued, as were detailed river running maps for the Salmon and the Feather Rivers. Special area mapping continues to be a high priority for the Forest Service, especially maps covering the scores of new wilderness, recreation, and scenic areas created since 1964.

After World War II, the Forest Service found a wider variety of federal government agencies willing to print the agency’s maps. The Engineer Reproduction Plant at The Army War College in Washington, DC had changed its name during the war to become the U.S. Army Map Service. The Army Map Service printed many large administrative maps for the Forest Service in the years immediately after the war. The printer of nautical and aeronautical charts also was called upon to print Forest Service maps. Many of the administrative maps for the national forests in the South were printed by the U.S. Coast and Geodetic Survey. The Intermountain Region depended heavily on the printing plant of the Defense Printing Service or DPS located in the same city as its Regional Office Ogden, Utah. The Northern Region also used the Defense Printing Service and its successor, the Air Force Printing Service or AFPS, to print some of its forest visitor maps and special mapping, but not to the extent that the Intermountain Region did. Otherwise, local printers of all sorts were contracted by the Regional Offices to print maps, such as the Rumford Press of Concord, New Hampshire or the Delzer Lithograph Company of Waukesha, Wisconsin. Many maps were printed locally but by unidentified printers. Printing notations on maps most often do not identify the actual printer, but simply state “Agriculture – Forest Service – San Francisco” or “Agriculture – Forest Service – Missoula.” Large format printers such as Geological Survey and the private firms of Williams & Heintz Company of Washington, DC and A. Hoen & Company of Baltimore, Maryland, continued to print the large sheet administrative maps, but in most cases, did not identify their company on the maps sheets they printed.

In summary, this twenty year post-war period carried with it the paradox of system-wide policies and standards being handed down from the Washington Office of the Forest Service as expressed in the priority given to the standard production of Class A Forest Series administrative maps and the decentralized, regional reprinting of largely obsolete administrative maps and a wide variety of recreation maps for the forest visitor. Each region of the Forest Service followed its own path in regard to the design, scale, information content, area priorities, and format of its folded recreation maps. Despite these two contradictory themes, Forest Service mapping made great advances in accuracy due to the use of aerial photography and the public was served an ever widening assortment of maps of system lands.
Mapping responsibilities were also growing as the system expanded. The system now included 3.8 million acres of new National Grasslands added in 1960 as well as several new national forests proclaimed in the Southern Region and the Winema National Forest in Oregon, which was created in 1961 mostly from lands of the former Klamath Indian Reservation. Also the Environmental Policy Act of 1969, which mandated environmental impact statements, made large and constant demands on the cartographic staff of the Forest Service for maps in both draft and final Environmental Impact Statements detailing proposed changes and various management alternatives. Towards the end of the period, the Class A administrative map became the new “mother map” of the Forest Service from which came maps of ranger districts, wilderness areas, and, seen first in California, Northern, and somewhat later in the other regions, the Class A Forest Visitor Map. The same quality and accuracy of the Forest Service Class A administrative map had now been extended to the maps used by the public from the 1970s to the present day.

11. Into the Future

Digitization has revolutionized mapping not only for the Forest Service but also for anyone or any organization creating or using spatial information. There has been so much change in the field, from GPS, to personal computer mapping tools to Geographic Information Systems, that the technology used to make maps in 1980 would seem completely foreign to those coming into cartography today. A big part of this change has been the ever-increasing capacity of computers to hold larger amounts of data in smaller and smaller spaces. Advances in computer memory have made it possible to input, store, and work with huge amounts of data to make highly accurate, well-designed, and informative maps. Today, the Forest Service, like many other map making organizations, has a large and diverse array of cartographic capabilities in support of its management goals as well as offering to the public an ever increasing number of forest visitor maps.

In 1992, the U.S. Geological Survey officially announced the completion of its 7.5-minute 1:24,000-scale topographic map series for the lower 48 states and soon thereafter made plans to digitize over 50,000 quadrangles and make them available free to anyone who could download them from the World Wide Web. Soon, the Geological Survey and the Forest Service were producing in paper an interagency version of the 7.5-minute topographic map for national forest areas with enhanced information showing national forest boundaries, special area boundaries, campgrounds, Forest Service administrative facilities and other information supplied by the Forest Service. The resulting dual agency map carried much more information than an ordinary 7.5-minute map issued previously by the Geological Survey in a well-designed way using unobtrusive color and symbols to convey important national forest information. The topographic quadrangle maps were a huge improvement over the 7.5-minute maps produced for the national forests of the Eastern Region in the early 1980s and printed by the Government Printing Office. When digitized, the 7.5-minute topographic maps almost instantly opened the door to a wide variety of uses in Geographic Information Systems operated by other agencies and the private sector. In a fairly recent development, the Southwestern and the Pacific Southwest Regions have started to produce topographic map atlases for various forests in a spiral bound “book” by reducing the 1:24,000-scale 7.5-minute quadrangles to 1:63,360-scale to fit the atlas format. And as with any digitally based map, these can quickly be updated and reissued.

Much work is still done in each of the Regional Offices of the Forest Service including some landmark map sets, such as the set of five topographic maps of the Lolo National Forest based on Ranger Districts, which was “constructed in 2009 by digital means at the Regional Office in Missoula, Montana from Forest Service Primary Base Series Cartographic Features File quadrangles with field review by the
Northern Region.” Map production for the Forest Service has largely been centralized at the “Geospatial Service and Technology Center” in Salt Lake City, Utah, formerly the Geometronics Services Center.

There has been much more cooperation with states and other federal agencies in the production of maps for forest visitors. The Pacific Northwest Region has for a number of years now been working with the states of Oregon and Washington and with several agencies within the federal Department of Interior in the production of the Pacific Northwest Recreation Map Series. The maps produced are not based on a particular national forest, or a particular land management district, but are issued for a unified region, such as the Oregon Coast, or the Southern Oregon Cascades. The public does not set out to visit only a national forest, but seeks to enjoy the public lands in a specific region, like Washington’s Olympic Peninsula not just the Olympic National Forest. The maps in this series are built with that idea in mind with all relevant agencies contributing data to make a true interagency map. The entire state of Oregon is covered in maps from this series while Washington State has six maps covering about 60% of its land area. The maps are produced in full color, on plasticized paper, often with shaded relief and are beautiful products of the digital age.

Maps today can be more specialized than ever before. Recently, the Forest Service, cooperating with the state of California, issued a folded visitors map entitled, “Lakes Basin Sierra Buttes & Plumas-Eureka State Park, map and recreation guide” on the Plumas National Forest showing both federal and state recreation areas with topography at a large scale of 1:31,680 or a half mile to the inch. This map is particularly good at showing trails throughout the whole area not just in the lands administered by the Forest Service. Forest Service trails connect with those in the Plumas-Eureka State Park. The Alaska Region has also moved away from the traditional style of map production of issuing one map for one national forest. Region 10 has created a new series of maps called “Specialty Maps” which focus on smaller areas such as the Juneau Area, or on an a particular island like Wrangell or Chichagof, or an administrative area such as the Admiralty Island National Monument. These maps carry a much larger scale than would be otherwise possible and are displayed on a topographic base. The 21st century has been marked by ever more cooperation, ever more variety, ever more detail, and ever more products.

The Forest Service continues to keep up with the changing technology. Newer maps have been issued with a QR (Quick Response) code, so a smart phone’s QR reader app can scan the code and download more information about the forest or special area. Recently, the Forest Service announced that the public can now access a variety of visitor maps using their Android and iOS devices via a mobile application. “This mobile app makes it easier than ever to plan your visit to a national forest or grassland,” said U.S. Forest Service Chief Tom Tidwell. “By putting important forest information right at your fingertips, it will encourage more Americans to get outside and explore their forests.” The PDF Mobile App, developed by Avenza Systems Inc., is available as a free download from iTunes and the Android Play Store. The app provides access to Forest Service maps, such as motor-vehicle-use maps, which are free while pages from national forest atlases are available for a minor charge. This development offers users the advantage to instantly download recreation site information when needed.

Part II. Map Distribution and Map Collections

It is important to identify the policies of the Forest Service regarding the distribution of its maps to the public because these policies determined which Forest Service maps can now be found by researchers in libraries and repositories today. Laws governing the distribution of documents and maps by the

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Government Printing Office also played a central role in determining the size and scope of map collections built by depository and other libraries over time throughout the nation.

1. The Perspective of the Forest Service

Being primarily a land management agency, there has been and continues to be a constant demand for cartographic products and services from both inside and outside the Forest Service. Internal cartographic needs have included maps and surveys for land acquisition, timber sales, land exchanges, homestead entries, roads and other improvements, boundaries, general administration and recreation. With its public face, however, the Forest Service has been somewhat ambivalent as to its identity and role as a federal mapmaker. In the 1913 edition of the *Use Book*, in its section on maps, it reads:

> “Special maps are issued for the use of Forest Service officers, or as special publications for the dissemination of information which can be best expressed graphically. Such maps are not for general distribution, though some are sold, and they may even be given away under certain circumstances. A general map of a National Forest may be given to a user when it is necessary or convenient to show thereon the lands covered by a transaction.”

This paragraph goes on to say that general maps of the United States as a whole showing the national forests are available to the public as are maps of North America showing natural forest areas and regional maps are available either from the Superintendent of Documents (Government Printing Office) or can be viewed at “first-class” libraries. By 1913 only a very few maps had been made by the Forest Service expressly for the public and these presumably are the maps noted as being available for sale by the Government Printing Office. Administrative maps of national forests were not generally available outside the agency, unless needed by bidders on timber sales, contractors for road or building construction, or for other transactions, such as a land exchanges.

Despite the steady improvement in map accuracy and the increase in the numbers of maps produced by the Forest Service from 1910 to the early 1920s, the agency sought to distinguish itself from other federal agencies that actively made and distributed maps for the nation such as the U.S. Geological Survey or the U.S. Coast and Geodetic Survey. On the Forest Service’s 1924 map of the United States, entitled, “*National Forests, State Forests, National Parks, National Monuments and Indian Reservations*” and subsequent editions of this map produced up to 1951, the Forest Service included an accurate, yet guarded statement concerning its mapping program:

> “The Forest Service is not primarily a mapping Bureau. The maps are prepared for use in the administration, development, and protection of the National Forests and they are not issued for sale and distribution to the public in the sense that the maps of Bureaus whose primary function is mapping are issued. In many instances, so few copies of the maps are required that the cost of the preparation of a press edition is not justified; in other instances small press editions suffice, such maps are not available for distribution to the public, although they may be consulted in the files of the Forest Service.”

The Forest Service is not primarily a mapping bureau, but it does make and issue maps for the public:

“For certain of the Forests which have attracted a great number of tourists and campers, informational maps are printed primarily for public distribution. These maps are usually a reissue of the administrative map on the scale of one-fourth inch equals one mile [1:253,440], to which text is added giving general information including the forest regulations. To a limited extent these maps are distributed free upon request; that is, as many as five maps may be furnished free, but a charge of 15 cents each is made for all maps above that number, to cover the cost of lithography.”

For national forests close to population centers, there is likely to be a map available for distribution to the public. There is evidence that the Forest Service supplied state tourist offices outside the state with maps. A 1928 *Road and Information Map for the National Forests of Oregon* seen in an academic library’s collection had stamped on its front cover “Oregon Inf. & Tourist Bureau, 115 W. 9th St. - Los Angeles” This indicates that folded forest visitor maps were officially distributed farther and wider than one might have expected.

Continuing with the Forest Service’s statement and in regards to the agency’s most detailed administrative maps:

“Editions are issued of an administrative map for each Forest usually on the scale of one-fourth inch equals one mile. Although these maps are prepared mainly for use of Forest Service officials, the edition is made large enough to permit furnishing a limited number of copies to persons cooperating in Forest Service work, or having legitimate interests in the Forests in cases where informational maps have not been published. To a limited extent these maps are distributed free upon request; that is, as many as five maps may be furnished free, but a charge of 15 cents each is made for all maps above that number, to cover the costs of lithography.”

“Civic organizations cooperating with the Forest Service may purchase maps in large quantities for free distribution. Further information upon this subject will be furnished upon request.”

These careful statements originated in Forest Service headquarters in Washington which was responsible for making and distributing this United States map and so must be seen once more in the context of the bureau’s decentralized administrative structure and the printing laws. The local offices involved could interpret the phrase, “persons cooperating in Forest Service work” quite broadly or narrowly as they determined. In one example, the famous University of Oregon anthropology professor, Luther S. Cressman, was able to gather a large collection of Forest Service administrative maps of the national forests of Oregon and California from the 1920s and 1930s that he then used in his field work. Professor Cressman was obviously seen as a cooperative person by the Forest Service. While not secret documents, as were the sheets of the *Forest Atlas*, distribution of administrative maps was well regulated. Only a token number of maps were retained by the Washington Office after printing; most were sent to the Regional Offices and to the forest supervisors and it must be assumed that most distribution decisions were more often made at the forest supervisor level.

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72 The Anthropology Department at the University of Oregon transferred its departmental map collection to the University Library in 1990. The majority of the Forest Service administrative maps from this collection were autographed “Luther S. Cressman”
Professor Cressman’s cooperation with the Forest Service proved to be a boon to the University of Oregon’s Map Library as his maps, as well as maps gathered by the Geology Department, later were transferred to the Library. Undoubtedly this kind of transfer occurred many times throughout the country as academics, business owners, outdoor organizations, and others donated their collections of both administrative and forest visitor maps to map libraries and historical societies.

The congress first gave the Department of Agriculture the legal authority to sell maps and aerial photography produced by its various bureaus in 1938. Under the Agricultural Adjustment Act of February 16, 1938 (Public Law 75-430, 52 Stat. 31, specifically 52 Stat. 68), the Secretary of Agriculture was allowed to sell “such aerial or other photographs, mosaics, and maps as have been obtained in connection with the authorized work of the Department to farmers and government agencies at the estimated costs of furnishing such reproductions, and to persons other than farmers at such prices (not less than estimating cost of furnishing such reproductions) as the Secretary may determine, the money received from such sales to be deposited in the Treasury to the credit of the appropriation charged with the cost of making such reproductions.” Sale of finished maps and base data was the funding mechanism that allowed the Forest Service to revise and produce maps for the public in an ongoing basis. In 1999 the Act was amended to include products available through the web as “geo-referenced “data.

Regional offices of the Forest Service retained copies of the maps that their Engineering departments had produced for their reference well into the 1960s. With government funding cutbacks and the early 1970s and 1980s, regional offices considered eliminating or drastically reducing their map collections. Office space cost the regional offices of the Forest Service money, collected by the federal government’s General Services Administration. Reducing the amount of space rented reduced the costs. Regions 1, 2, and 4 still have collections of maps, though smaller in size, covering the national forests in their region, while other regions let their collections go to colleges, universities, or historical societies or have distributed their map files to national forest supervisor’s offices and ranger districts. Upon examination of the map collection held by the Northern Region, the collection in Missoula holds the only publically available copies of some national forest maps, such as the 1913 topographic map of the Lolo National Forest. Holdings information found at the end of each map citation will enable users of this reference to identify unique maps.

2. The Role of the Government Printing Office

The Government Printing Office in fulfilling its obligations under the authority of the Printing Act of 1895 (January 12, 1895 (28 Stat. 601) and later under Depository Library Act of 1962 (August 9, 1962, Public Law 87-579 (76 Stat. 352) operates a public oriented depository program, shipping to member libraries the output of its presses and those of its contractors. The 1895 law provided for the appointment of a Superintendent of Documents and directed the Superintendent to: “receive and care for all surplus documents in the possession of Government offices; assort and catalog them; supervise their distribution and sale; catalog and index monthly and annually all documents published; in fine to render accessible to librarians and the public generally the vast store of Government Publications.” Also, “A catalogue of Government Publications shall be prepared…on the first day of each month, which shall show the documents printed during the preceding month, where obtainable, the price thereof” became part of the

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73 After visiting Region 1 in Missoula, the cartographic engineer told the author that in the 1980s much of the map collection in the basement of the federal building was distributed to the individual national forests and their Ranger Districts or thrown away. What was left in the basement were Folios, large scale forest maps, and a large quantity of 1:506,880-scale administrative maps.


75 *United States Statutes at Large*, Volume 28, page 612.
Superintendent of Documents’ responsibilities. The Government Printing Office distributed to its network of depository libraries such important documents as the annual reports of the U.S. Forest Service, National Forest Reservation Commission, the U.S. Geological Survey including those volumes on the forest reserves, as well as U.S. Department of Agriculture publications on forestry and folded forest visitor maps that the Government Printing Office contracted to be printed. Exempted from this obligation to distribute to depository libraries were those publications, “…printed for the special official use of the Executive Departments…”76 Thus, the folios of the Forest Atlas series and administrative maps were not distributed, because these were considered by the Forest Service to be primarily administrative in nature. The 1962 Depository Library Act also carried this exemption for administrative publications. “Government publications, except those determined by their issuing components to be required for official use only or those required for strictly administrative or operational purposes which have no public interest or educational value, and publications classified for reasons of national security, shall be made available to depository libraries…” 77

The 1962 law extended the network of depository libraries and the reach of the program, calling for each agency of the federal government to furnish the Superintendent of Documents with a listing of its publications which the agency issued in the previous month that were obtained from sources other than the Government Printing Office. Once this listing was received, the GPO then asked the agency to furnish enough copies of the publications to distribute to depository libraries. In practice, however, many forest visitor maps and other maps made for the public and printed by local printers and which should have been distributed to depository libraries were not, in spite of the 1962 law. This is due largely because of short staffing at GPO for enforcement, the equivocal nature of the term “administrative,” and the Superintendent of Documents’ reliance on the public and government documents librarians to inform the GPO of the existence of publications and maps that should be part of the depository distribution system. This issue of federal government agencies printing their maps and other publications locally and not following the distribution rules of the depository laws affected not only the Forest Service but many other federal agencies as well. Many of the forest visitor maps made by the Northern Region office, but printed in Missoula or at the Defense Printing Plant in Ogden, Utah from 1951 into the 1970s, were never distributed by the Government Printing Office. Many special public recreational maps and brochures issued by the Forest Service throughout the nation were also not included in the depository library program. Thus, unless actively sought by librarians, or received as gifts and placed into library collections, libraries will often lack many Forest Service maps. Whenever a Monthly Catalog citation has been supplied for a given map citation in the Regional Chapters, that map was distributed by the Government Printing Office. The opposite is true if there is no Monthly Catalog citation. Some Forest Service maps were issued without a date, or with a date much older than when the map was distributed. Providing a Monthly Catalog citation can help with the dating of some maps, particularly for forest visitor maps produced by the Rocky Mountain District from 1919 to 1926, which lack accurate publication dates.

3. Forest Service Maps in Libraries

Besides the Forest Service maps that entered depository library collections through the distribution network of the Government Printing Office, how does one account for the many administrative maps and forest visitor maps not distributed by the government now found in libraries? Two methods have already been outlined, one of them being gifts from academics on the faculty of colleges and universities and to a lesser extent, donations from regional offices and headquarters of National Forests of surplus maps. Perhaps the most important part of building a library of maps is the librarian or the staff professional who

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76 United States Statutes at Large, Volume 28, page 610.
77 United States Statutes at Large, Volume 76, page 352
recognizes their value to their educational institution. Without a resource person on the lookout for relevant maps, a map library suitable for research cannot be built.

Forest Service maps can come into libraries by soliciting gifts from the public at large. Map librarians travelling to regional and even national conferences held at libraries can often review quantities of surplus maps available for the taking or can ask their colleagues about surplus maps needing new homes. Gifts from individuals and exchanges between libraries can be a major source of historic maps. Very few Forest Service maps have appeared in map dealer catalogs and it has only been since the mid-1990s when web auction houses such as eBay have allowed the average citizen the chance to market collectables including Forest Service maps to the general public. Web auction sites have become an important place to search for Forest Service maps and for price information. The highest price realized that the author has seen for a Forest Service map occurred on a May, 2005 eBay sale of the 1915 proclamation diagram for the Sierra National Forest in California for $100.00. Undoubtedly there have been other maps sold for higher prices, but on average, Forest Service maps from the 1910s have been sold from $40 to $75; the 1920s and 1930s, in the $20 to $40 range; and more modern maps less than that, although competition among bidders can move the price of an individual map much higher. As with any vintage item considered “collectible,” prices vary depending largely on condition.

Many older Forest Service maps were de-accessioned by libraries once a newer edition had been received through the depository library program. This replacement process can account for the lack of historic Forest Service maps in many collections. Discarding older maps should be made not in isolation, but in relation to other libraries in the area. Once gone from the collection it will be quite difficult to find another copy. The spread of web-based searchable library catalogs can help make determinations about the scarcity of a particular map and other libraries holding the map. Often in libraries, forest visitor maps distributed by the Government Printing Office were cataloged as books, bound between boards, and placed into the general circulating collection. Library staff should be aware of this past practice and attempt to retrieve these early Forest Service maps and store them flat in map cabinets and should these maps ever be considered for de-accessioning while cataloged as books, they should be examined by library professionals before they are allowed to leave the library.

Part III. The Cartobibliography, Citation Key, and Index to Cartographers

1. Scope and Arrangement

The cartobibliography appearing after the administrative history of each national forest in the Regional Chapters includes forest mapping published by the federal government from 1891 until about 1975. The ending date was chosen for two reasons. First, the Government Printing Office adopted the MARC (MAchine Readable Cataloging) record format, a standard descriptive cataloging format, early in 1976 and began to catalog Forest Service maps directly into the OCLC national bibliographic utility. The Library of Congress created the MARC format for books, maps, and other non-book formats. These MARC cataloging records were published directly into the Government Printing Office’s Monthly Catalog of Government Publications. With common descriptive rules for maps, libraries too, began in earnest to contribute their own map records, both current and historical, to the national database along with the Library of Congress and the Government Printing Office. Because more is known about Forest Service maps after these developments of the mid-1970s, both those printed by the Government Printing Office and those printed locally, there is less of a need to list here what has already been gathered together in the national bibliographic database. Second, the Forest Service in and around 1975 began to bring its forest visitor’s maps into conformity with its administrative maps, the majority of which were
published at a scale of 1:126,720 or 2 miles to the inch with a high accuracy rating of “Class A.” Slowly over the years, maps issued for the public ceased to have that local look and feel, characteristic of the Forest Service Region in which they were produced. The only difference between the administrative map and the forest visitor map from the mid-1970s onward was that most maps made for the public included descriptive text, photographs, and was folded.

Some types of maps will not appear in the cartobibliography. Only published maps and maps that have been personally examined or found on WorldCat (OCLC’s internet catalog) are to be found in the listing. The map holdings of the National Agriculture Library, Library of Congress, National Archives, as well as academic libraries have been the main source of map citations. There are several categories of maps that are not found here: manuscript maps, drawings, cadastral maps, published maps with manuscript annotations, all being unique and not commonly held, are left off as are most every Forest Service thematic maps, maps made to illustrate environmental impact statements and forest management plans, and commercial reformatting of Forest Service maps. Fire control maps issued annually for the forests of Southern California are noted when these also served as forest visitor maps. Internal engineering maps and drawings made for forest improvements such as roads, trails, telephone systems, and fire protection facilities as well as timber sale maps are not included here. As a general rule, the cartobibliography lists the maps that are available for review by the public in libraries, government agencies, and institutions.

Every effort has been made to include as many significant regionally produced special area maps, such as recreation areas, trails, driving tours, and the like, as was possible. Yet due to their numbers, singularity, and ephemeral nature, this type of map was difficult to identify and gather. Other maps for wilderness areas and national grasslands were widely distributed. These are included here in separate sections. Before World War II, when the Forest Service produced a new administrative map, the agency usually issued the map at two scales, 1:253,440-scale and 1:126,720-scale or a 4-inch map and a 2-inch map. There were occasions when the Forest Service issued a “suite” of maps, that is, a set of administrative maps at both 1:126,720 scale and at 1:253,440-scale accompanied by a Forest Visitor folded map all issued in the same year. The 1931 maps covering the Nezperce National Forest are an example of this rare coincidence. As appealing as this symmetry is, however, one cannot assume that the presence of one edition means the existence of the others. For instance, for the Absaroka National Forest administrative maps at 1:253,440-scale were issued in 1919 and 1925, yet complimentary administrative maps at 1:126,720-scale for these two years could not be located in any research institution or found cataloged in any bibliographic database. This is in contrast to the two administrative maps with these two scales issued simultaneously for the Absaroka National Forest in 1930, 1933, and 1937. 2-inch maps for 1919 and 1925 have not been seen nor have they appeared in any database so therefore, they do not appear in this map listing, although they may be discovered later.

Due to the unique mapping characteristics found in each region of the Forest Service, the cartobibliography for each Regional Chapter is arranged in a slightly different ways. This is especially true for the early maps of the Forest Reserves produced by the U.S. Geological Survey. But in general, the first maps to be listed are those showing the whole region and then by smaller areas in the region not identified with a particular national forest. Next to be listed are General Land Office state maps included in whole or in part of the particular region followed by the largest segment of the map listing, the maps of individual forest reserves and national forests. Ahead of each map listing are a few paragraphs on each forest and an administrative history in chronological order by event. The cartobibliography for each forest reserve and national forest concludes with a separate listing of special mapping: wilderness areas, national grasslands, and miscellaneous areas. Finally, indexes to the names of the cartographers that appeared on maps differentiated by federal agency and a bibliography of sources used in the compilation of this work conclude each Regional Chapter.
Internal arrangement of the cartobibliography is by date of publication. In order to preserve this chronological arrangement and, at the same time, maintain a strong link between a national forest’s administrative history and its maps, under each forest the first maps to be listed are those that accompany Presidential Proclamations and Executive Orders. Most every proclamation diagram are found reproduced in the pages of the United States Statutes at Large and these are noted with an * in the administrative history itself. But the proclamation diagrams described in citations are those printed separately and not the smaller page-sized diagrams found in the U.S. Statutes at Large. Executive order maps were only issued separately and most do not include maps. After the proclamation and executive order maps come any General Land Office maps produced for the forest reserve, then Geological Survey mapping, Forest Atlas citations, and finally U.S. Forest Service mapping up to 1975.

The order of map entries within each agency category is first by date. If two or more maps have the same date, then by scale, the larger scale map listed first. If two or more maps have the same date and scale, then by map type in this order: administrative, topographic, forest visitor or recreation map. Maps of a forest’s ranger districts will always follow an administrative map of the entire forest if both map types have the same date. Information enclosed with brackets is information derived from a source other than the map itself or if accompanied by a “?” it is the author’s best estimate.

2. Use

Since many of these early forest reserves were later broken up into smaller national forests and renamed, it is important for a researcher to note that if they are examining the modern day Kaniksu National Forest, for instance, the first entry in the administrative history for the Kaniksu notes that the forest was established from lands of the Priest River National Forest. At that point, our user should examine the map listings for the Priest River Forest Reserve and National Forest 1897-1908 to discover additional mapping resources, such as the U.S. Geological Survey mapping for areas now embraced by the Kaniksu National Forest. Similarly, in reviewing the administrative history and mapping of early forest reserves, note the last entry in each that specifies the fate of that early national forest. Then follow up by surveying these newer national forests for maps covering the area of interest. Cross references are provided, but users should rely on the administrative histories to take them back and forth in time to other areas to gain the complete record of any given national forest or specific land area.

3. Sample Map Entry (see Illustration 13, 14, and 15 below)

1) Flathead National Forest, Montana, 1927, (Forest Visitor’s map)
3) 1927. Scale, ca. 1:253,440. W114°35’ – W112°50’/N48°30’ – N47°10’. Public land (Township & Range) grid. Black & white. 64 x 58 cm. folded to 22 x 10 cm. Relief shown by hachures and spot heights.
4) Shows national forest, national park, Indian Reservation, and county boundaries, towns and settlements, roads, trails, railroads, Forest Service administrative facilities and other structures, rivers, lakes, and streams. “Montana Principal Meridian.”

7) Holdings: Univ. of Washington; LC; NA

8) OCLC: (in this map’s case, none available)
**Illustration 13:** Front and back illustrated panels for the 1927 forest visitors’ map for the Flathead National Forest, Montana as described in the sample citation.

![Illustration 13: Front and back illustrated panels for the 1927 forest visitors’ map for the Flathead National Forest, Montana](image13)

**Illustration 14:** Unfolded map showing title block, upper right corner, for the 1927 Flathead National Forest, Montana.

![Illustration 14: Unfolded map showing title block, upper right corner, for the 1927 Flathead National Forest, Montana](image14)
Illustration 15: Compilation statement from the lower left corner of the unfolded 1927 Flathead National Forest map. The statement, “Printed by the U.S. Geological Survey” appears in the lower right corner outside the neat line.

Explanation:

First line, title information: 
Title of the map as it appears open and flat. (Type of map if not obvious from the title in parentheses)

Second line, statement of responsibility: 
Agency and/or author information as it appears on the map. Revisions if any. Printing information if available on the map. Reprinting information if any.

Third line, mathematical data: 
Date, [Date not verified], scale, geographic coordinates only if printed on the map, Public land grid shown or not shown, color or black & white, physical dimensions, height by width in centimeters, and if folded, dimensions folded, how relief is depicted or not (if a topographic map, the contour interval is provided).

Fourth line, descriptive information found on the main map: 
Explanation of color or colors, boundaries, transportation, cultural features such as towns and structures, physical features. Also includes special attributes of the map such as map class, principal meridian, index, special areas shown, and other information.

Fifth line, descriptive information found on the verso and folded title panel of the map, if necessary: 
Existence of text or photographs or other characteristics such as location maps, etc. Panel title information. Panel illustration. Other important information found on the folded title panel such as date and printing information.

Sixth line, map reference: 
Whenever a specific reference is found in an index or annual report of another agency for an individual map or Forest Atlas, it is provided here as are Government Printing Office Monthly Catalog citations.

Seventh line, holding information: 
Listing of institutions holding this map in its collections. NA= National Archives; NAL = National Agricultural Library; LC = Library of Congress, Geography and Map Division; University and public libraries are spelled out. If held by more than 10 Libraries, the map is considered commonly held, and only the holdings of the Library of Congress, National Archives, or National Agricultural Library are indicated.

Eighth line, national cataloging information: 
OCLC catalog number when available. Libraries will sometimes catalog a forest visitor map as a book and not a map. Where possible, both cataloging formats (book and/or map) represented by OCLC catalog numbers are provided as well as relevant holdings information.

4. Cartographers
Over 370 individual cartographer’s and draftsmen’s names have been identified on forest mapping from the 1890s until the early 1960s when the practice of including cartographer’s names in the map’s credit lines ceased. This includes General Land Office and Geological Survey cartographic staff, cartographers both in the Washington Office and those in all regional offices of the Forest Service. The practice of naming cartographers on the maps came to an end earlier in some regions, notably the Pacific Northwest Region that stopped including names by the mid-1940s. The Northern Region ceased the practice of naming those responsible for compiling and tracing map work in 1961.

It was customary for engineering staff, not just in the Forest Service but also in many other federal agencies to identify themselves with initial letters of their first and middle names and then with their full last names. In some cases, names of cartographers were expressed entirely with initials. Even the veteran Forest Service engineer who served as Chief of the Engineering Division from 1920 to 1947, Theodore W. Norcross, expressed his name as T.W. Norcross on all Forest Service publications, directories, and maps. One will never see his first name on any of his work. Importantly, this custom not only disguised the identity of the cartographer, the custom also hid the identity of women cartographers. The work of women cartographers of the Forest Service has been revealed by this examination of Forest Service mapping. Early Forest Service staff directories issued by the agency itself did not reach down to fully list the rank and file and so are of limited use in identifying its cartographers up to about 1940. After this date most all Forest Service staff came to be listed. Even so, initials continued to be used in place of full first and middle names.

To obtain the most complete name possible for the index of cartographers, city directories for Washington, DC and for all the cities where regional offices are located were consulted. City directories for Philadelphia including its suburb of Upper Darby, Pennsylvania, the headquarters of the Eastern Region, were not issued after 1935, but Forest Service staff directories were useful in determining which Eastern Region cartographers moved from Washington, DC to Philadelphia when the Eastern Region’s headquarters left the nation’s capital in 1941. Far too many names could not be located, but most have been identified, some with interesting stories as the city directories often included the person’s occupation or employer. Typical are the results from the Northern Region. Of the 64 Forest Service cartographers identified on Region One maps, only 10, or 6.4%, remain known only by their initials or last names. Three of these 10 unknowns all appeared on one map of a special area and no others, perhaps indicating that this map was obtained from a contractor outside of Washington, DC, Missoula, Montana, and other cities where regional offices were located.

Many women cartographers were identified system-wide including two who had changed their last names due to marriage. Most cartographers were locally hired and only a handful of cartographers moved from one regional office to another. Each regional chapter in this reference work will include an index of cartographer’s names, the form(s) of the name found on Forest Service maps, a listing of the maps that carry their name in the credits, and a short sketch of their careers if revealed by their entries in the city directories. Also listed are the names of the cartographic staff of the U.S. Geological Survey and the General Land Office who made important maps of the national forests. A complete listing of cartographers can be found in the “Union Lists” section of this reference work. The list is not an attempt to be a comprehensive directory or biography of all Forest Service or other agency cartographic or engineering personnel. Only those names that appear on maps are included.